Library of Congress Cataloging-in-Publication Data

A Scientific Humanist : studies in memory of Abraham Sachs / edited by Erle Leichty, Maria deJ. Ellis, and Pamela Gerardi.

p. cm. -- (Occasional publications of the Samuel Noah Kramer Fund ; 9)

ISBN 0-934718-90-3

1. Astronomy, Assyro-Babylonian. 2. Sachs, Abraham. I. Leichty, Erle, 1933- . II. Ellis, Maria deJ. III. Series.

QB19.S44 1988

520'.935--dc19

88-30306

CIP

NOTE: Series Name Change
Publications of the Samuel Noah Kramer Fund, 9
succeeds Publications of the Babylonian Fund, 8

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PREFACE

Abe Sachs was a *mensch*. My first contact with him came while I was studying first-year Akkadian. I was still wet behind the ears when I found two very uninteresting, but yet unpublished, Neo-Babylonian receipts in the Kelsey Museum at the University of Michigan. In my naiveté, I made crude copies, bad transliterations, poor translations, and inane commentary, and foolishly sent the manuscript off to Abe Sachs, Associate Editor of *Journal of Cuneiform Studies*. I deserved the fate of Te-Umman, the Elamite, and might well have received it had I submitted that dreadful manuscript to the chief editior Albrecht Goetze. Instead, Abe showed the patience of Job and returned my sad work with everything corrected, suggestions for further research and several kind words of encouragement. Years later, when I recalled this incident to him, he accused me of having a faulty memory, saying he was "*never* kind to young people." Many of the contributors to this volume will attest to the fact that my experience with Abe was commonplace.

During my days on the Chicago Assyrian Dictionary Project I had contact regularly with Abe through his steady stream of letters and postcards with additions and corrections for the dictionary impishly addressed "Dear Dictionary," and invariably signed "your humble and devoted servant, Abe." It was typical of Abe that he would take the trouble to share his discoveries with a project that benefits us all. And, it was also typical that he would do so with droll, gentle wit.

Even though Abe and I spent an inordinate proportion of our careers at the British Museum, our paths never crossed. It was not until I moved to Pennsylvania that I finally met him. Abe was a very private person and he did not frequent scholarly meetings or other gatherings. However, until his emphysema restricted him, he did like to come to the Christmas meetings of the east coast Assyriologists that used to convene annually in New Haven. It was at these sessions that I finally had the good fortune to spend some time with Abe and to benefit from his great erudition. Abe had an extraordinarily quick and agile mind. He had read widely in every genre of cuneiform and had pondered deeply the myriad problems Assyriologists face in trying to comprehend ancient Mesopotamian civilization. One of my fondest memories is of Abe expounding on critical issues raised by his colleagues. His thoughts on any subject were always well reasoned and full of common sense. I sometimes regret that I did not follow the example of many of my colleagues and make a pilgrimage to Brown early in my career.

Abe was generous to a fault. He had worked in most of the cuneiform tablet collections in the world and had extensive notes on each one. He was quick to share these notes with anyone who showed an interest. He was always dipping into his vast storehouse of knowledge and giving transliterations, tablet numbers, and bibliography.

Abe is greatly missed by me, by the contributors to this volume, and by many others throughout the world, but we are all a little richer for having known him. This volume is a very small tribute to Abe Sachs, a scientific humanist.

Erle Leichty
December 1988

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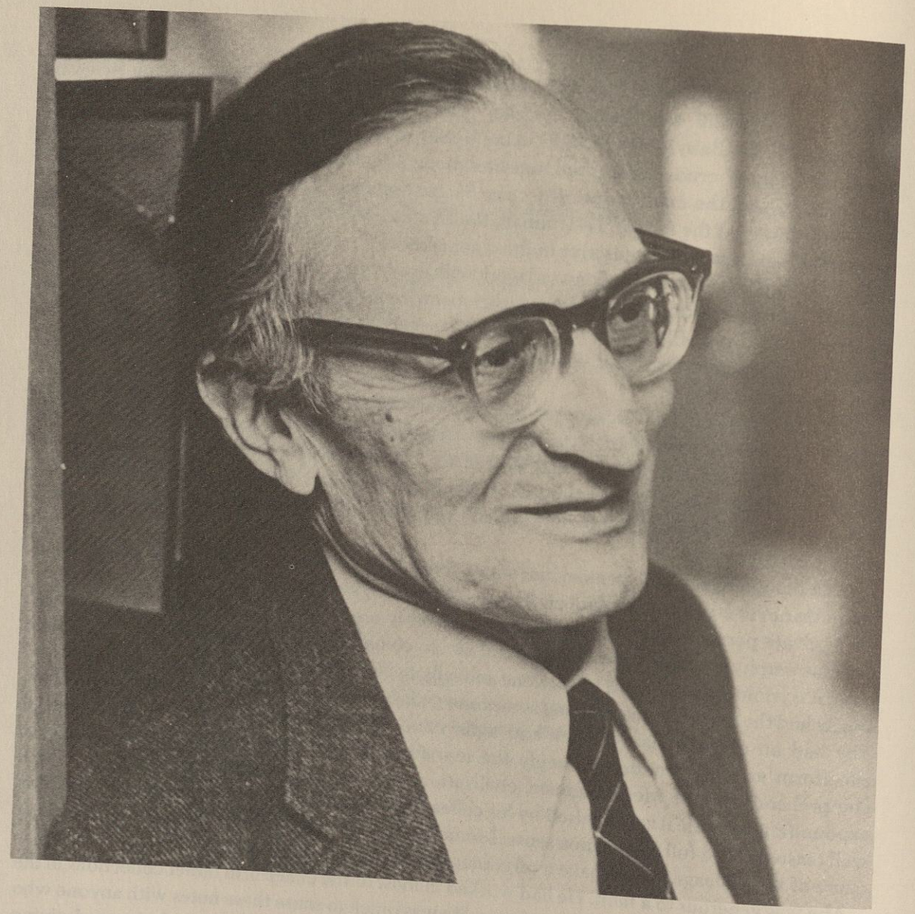

Abraham J. Sachs
(1915-1983)

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ABBREVIATIONS

A	tablets in the collection of the Oriental Institute (Chicago)
AAA	*Annals of Archaeology and Anthropology*
AASF	*Annales Academiae Scientiarum Fennicae*, Series B (Helsinki)
AASOR	*Annual of the American Schools of Oriental Research*
AB	Assyriologische Bibliothek
AB	tablets in the collection of the Bodleian Library
ABAW	*Abhandlungen der Bayerischen Akademie der Wissenschaften, philosophisch-historische Klasse* (München)
AbB	F.R. Kraus, *Altbabylonische Briefe in Umschrift und Übersetzung*
ACT	O. Neugebauer, *Astronomical Cuneiform Texts*
AfK	*Archiv für Keilschriftforschung*
AfO	*Archiv für Orientforschung*
AHES	*Archive for the History of Exact Sciences*
AHw	W. von Soden, *Akkadisches Handwörterbuch*
Ali, *Letters*	F.A. Ali, *Sumerian Letters: Two Collections from the Old Babylonian Schools* (unpub. Ph.D. diss. University of Pennsylvania, 1964)
AJSL	*American Journal of Semitic Languages and Literatures*
ANET	J.B. Pritchard, ed., *Ancient Near Eastern Texts relating to the Old Testament*
AnOr	*Analecta Orientalia*
AnSt	*Anatolian Studies*
AO	tablets in the collections of the Louvre
AOAT	Alter Orient und Altes Testement
AOS	American Oriental Series
AOT	tablets in the collections of the Louvre (Tello)
APAW	*Abhandlungen der Preuss. Akademie der Wissenschaften phil.-hist. Kl.*
APS	American Philosophical Society
ARET	Archivi reali di Ebla, Testi
ARM	Archives royales de Mari

ARMT	Archives royales de Mari, Texte
ArOr	*Archiv Orientální*
ARRIM	*Annual Review of the Royal Inscriptions of Mesopotamia*
AS	Assyriological Studies (Chicago)
ATHE	B. Kienast, *Die Altassyrischen Texten des Orientalischen Seminars der Universität Heidelberg und der Sammlung Erlenmeyer Basel*
BA	*Beiträge zur Assyriologie . .*
Bagh. Mitt.	*Baghdader Mitteilungen*
BAM	F. Köcher, *Die babylonische-assyrische Medezin in Texten und Untersuchungen*
BCH	*Bulletin de correspondance hellenique*
Bickerman, *Chronology*	E.J. Bickerman, *Chronology of the Ancient World*
Bi.Mesop.	*Biblioteca Mesopotamica*
BiOr	*Biblioteca Orientalis*
BM	tablets in the collections of the British Museum
Bo.	field numbers of tablets excavated at Boğazköy
Böhl Coll.	tablets in the collection of Liagre Böhl, Leiden
Boll, *Paulys Realencyklopädie*	F. Boll, *Paulys Realencyklopädie der classischen Altertums-wissenschaft*
BRM	*Babylonian Records in the Library of J. Pierpont Morgan*
BWL	W.G. Lambert, *Babylonian Wisdom Literature*
CAD	*The Assyrian Dictionary of the Oriental Institute of the University of Chicago*
CBS	tablets in the collections of The University Museum of the University of Pennsylvania, Philadelphia
CCT	Cuneiform Texts from Cappadocian Tablets
CHD	H.G. Güterbock and H.A. Hoffner, eds., *The Hittite Dictionary of the Oriental Institute of the University of Chicago*
CRRAI	Compte rendu, rencontre assyriologique internationale
CT	Cuneiform Texts from Babylonian Tablets in the British Museum
CTH	E. Laroche, *Catalogue des textes hittites,*
CTN	Cuneiform Tablets from Nimrud
Cohen, *Eršemma*	*M. Cohen, Sumerian Hymnology: The Eršemma*
Doty, *Archives*	L.T. Doty, *Cuneiform Archives from Hellenistic Uruk*, (unpub. Ph.D diss., Yale University, 1977)
DSB	*Dictionary of Scientific Biography*

Dübner, *Scholia*	F. Dübner, *Scholia graeca in Aristophanem*
Edzard, *Sumerische Rechtsurkunden*	D.O. Edzard, *Sumerische Rechtsurkunden des III. Jahrtausends*
Edzard, *Tel ed-Dēr*	D.O. Edzard, *Altbabylonische Rechts-und Wirtschaftsurkunden aus Tel ed-Der im Iraq Museum, Baghdad,* ABAW 72
EHE	tablets in the collection of E. Tisserant
Emar	D. Arnaud, *Recherches au pays d'Aštata:* Emar 6/1
Falkenstein, *Topographie*	A. Falkenstein, *Topographie von Uruk, I. Teil: Uruk mit Seleukidenzeit*
FAOS	Freiburger altorientalische Studien
FB	*Forschungen und Berichte* (Staatliche Museen in Berlin)
Finkelstein Mem.	M. deJ. Ellis, ed., *Essays in the Ancient Near East in Memory of J.J.Finkelstein*, Memoirs of the Connecticut Academy of Arts and Sciences 10
FLP	tablets in the collection of the Free Library of Philadelphia
Foster, *Umma*	B.R. Foster, *Umma in the Sargonic Period*, Memoirs of the Connecticut Academy of Arts and Sciences
Frayne, *Sumerian Royal Hymns*	D.R. Frayne, *The Historical Correlations of the Sumerian Royal Hymns* (2400-1900 B.C.) (unpub. Ph.D diss., Yale University, 1981)
FrGH	*Die Fragmente der greichischen Historiker*
Frymer-Kensky, *Judicial Ordeal*	Tikva S. Frymer Kensky, *The Judicial Ordeal in the Ancient Near East,* (unpub. Ph.D diss., Yale University, 1977)
Fs. Friedrich	R. von Kienle, *Festschrift Johannes Friedrich zum 65. geburtstag*
Gerkan, *Städteanlagen*	A. von Gerkan, *Griechische städteanlagen*
HAB	F. Sommer und A. Falkenstein, *Die Hethitisch-akkadische Bilingue des Hattušili I* (ABAW NF 16)
Haddad	field numbers of tablets excavated at Tell Haddad
HAMA	O. Neugebauer, *History of Ancient Mathematical Astronomy*
HED	J. Puhvel, *Hittite Etymological Dictionary*
Heiberg, *Ptolemaei*	Heiberg (ed.), *Claudii Ptolemaei Opera quae existant omnia*
Heimerdinger, OPBF 4	J. Heimerdinger, *Sumerian Literary Fragments from Nippur,* OPBF 4
Heinrich, *Die Tempel*	E. Heinrich, *Die Tempel und Heiligtümer im alten Mesopotamien: Typologie, Morphologie, und Geschichte, Denkmaler antiker Architektur* 14
Hist. de l' astron.	*Recherches sur l'histoire de l'astronomie ancienne*
HKl	R. Borger, *Handbuch der Keilschriftliteratur*

HSS	Harvard Semitic Series
Huber, *Astronomical Dating*	P.J. Huber, *Astronomical Dating of Babylonia I and Ur III*
HUCA	*Hebrew Union College Annual*
Hunger, *Kolophone*	H. Hunger, *Babylonische und assyrische Kolophone*, AOAT 2
HW	J. Friedrich and A. Kammenhuber, *Hethitisches Worterbuch*
IF	*Indogermanisch Forschungen*
IM	tablets in the collections of the Iraq Museum
ISET	Istanbul Arkeoloji Müzelerinde Bulunan Sumer Edebî tablet ve Parçalari
Jacobsen, *Salinity*	Th. Jacobsen, *Salinity and Irrigation Agriculture in Antiquity*, Bi.Mesop. 14
Jacobsen, *Treasures*	Th. Jacobsen, *Treasures of Darkness*
JANES	*Journal of the Ancient Near East Society*
JAOS	*Journal of the American Oriental Society*
JBL	*Journal of Biblical Literature*
JCS	*Journal of Cuneiform Studies*
JEOL	*Jaarbericht van het Vooraziatisch-Egyptisch Genootschap "Ex Orient Lux"*
JHA	*Journal of the History of Astronomy*
JHS	*Journal of Hellenic Studies*
JNES	*Journal of Near Eastern Studies*
JQR	*Jewish Quarterly Review*
K	tablets in the collections of the British Museum
KAR	Keilschrifttexte aus Assur religiösen Inhalts
KAV	Keilschrifttexte aus Assur verschiedenen Inhalts
KBo	Keilschrifttexte aus Boghazköi
KUB	Keilschrifturkunden aus Boghazköi
Kugler, *Mondrechnung*	F.X. Kugler, *Die Babylonische Mondrechnung. Zwei Systeme der Chaldäer über den Lauf des Mondes und der Sonne*
LAK	A. Deimel, *Liste der archaischen Keilschriftzeichen*, WVDOG 40
LAS	S. Parpola, *Letters to the Assyrian Kings Esarhaddon and Assurbanipal*, 2 vols., AOAT 5/1 and 5/2
La Sor AV	G. Tuttle, *Biblical and Near Eastern Studies: essays in honor of William Sanford La Sor*
Lasserre, Die Fragmente	F. Lasserre, *Die Fragmente des Eudoxos von Knidos*

LBAT	T.G. Pinches, et.al., *Late Babylonian Astronomical and Related Texts, copied by T.G. Pinches and J.N. Strassmaier, prepared for publication by A.J. Sachs, with the cooperation of J. Schaumberger*
Limet, *Liège*	*Études de documents de la période d'Agadé appartenant à l'Université de Liège*
M.	field numbers of tablets excavated at Mari
MAD	I.J. Gelb, Materials for the Assyrian Dictionary
MARI	Mari Annales de Recherches Interdisciplinaires
MCT	O. Neugebauer, *Mathematical Cuneiform Texts*
MEE	Materiali Epigraphici di Ebli
MIO	*Mitteilungen des Instituts für Orientforschung*
MKT	O. Neugebauer, *Mathematische Keilschrifttexte*
MLC	tablets in the collections of the J. Pierpont Morgan Library
Moren, *Šumma ālu*	S.M. Moren, *The Omen Series "Šumma Alu"* (unpub. Ph.D. diss. University of Pennsylvania, 1978)
MSL	Materialien zum sumerischen Lexikon
MVAG	Mitteilung der Vorderasiatischen Gesellschaft
NABU	Nouvelles Assyriologiques Brèves et Utilitaires
NCBT	tablets in the Newell Collection of Babylonian Tablets, Yale University
ND	field numbers of tablets excavated at Nimrud (Kalhu)
Nemet-Nejat, *Field Plans*	K.K. Nemet-Nejat, *Late Babylonian Field Plans in the British Museum*, Studia Pohl Series Maior 11
Neugebauer, *Tables*	O. Neugebauer, *The Astronomical Tables of al-Khwārizmī*,
Newcomb, *Researches*	S. Newcomb, *Researches on the Motion of the Moon*
NF	Neue Folge
NS	Nova Series, New Series
NSG	A. Falkenstein, *Neue sumerische Gerichtsurkunden*
N-T	field numbers of tablets excavated at Nippur
OB	Old Babylonian
OCD	*Oxford Classical Dictionary*
OIC	Oriental Institute Communications (Chicago)
OIP	Oriental Institute Publications (Chicago)
OLZ	*Orientalistische Literaturzeitung*
OPBF	Occasional Publications of the Babylonian Fund

Or	*Orientalia*
OrSuec	*Orientalia Suecana*
Pack, *Administrative Structure*	D. Pack, *The Administrative Structure of the Palace at Mari* (*ca. 1800-1750* B.C.) (unpub. Ph.D diss., University of Pennsylvania, 1983)
Pannekoek, *HistAst*	A. Pannekoek, *A History of Astronomy*
PASP	Publications of the Astronomical Society of the Pacific
PBS	Publications of the Babylonian Section (Philadelphia)
Pingree, *Yavanajātaka 2*	D. Pingree, *The Yavanajātaka of Sphujidhvaja 2*, Harvard Oriental Series 48
R	H.C. Rawlinson, *The Cuneiform Inscriptions of Ancient Western Asia*
RA	*Revue d'assyriologie et d'archéologie orientale*
RE	A. Pauly, G. Wissowa, et. al., eds., *Paulys Realencyklopädie der classischen Altertumswissenschaft*
RÉC	F. Thureau-Dangin, Recherches sur l'origine de l'écriture *cunéiform*
Reiner and Pingree, *Omens*	E. Reiner and D. Pingree, *Babylonian Panetary Omens, II: Enūma Anu Enlil, Tablets 50-51*, Bi.Mesop. 2/2
RevPhil	*Revue de Philologie*
RG	Répetoire géographique des textes cunéiformes
RHA	*Revue hittite et asiatique*
RHR	*Revue de l'histoire des religions*
RlA	*Reallexikon der Assyriologie*
Rm.	tablets in the collections of the British Museum
RTC	F. Thureau-Dangin, *Recueil des Tablettes Chaldéennes*
Salonen, *Hausgeräte*	A. Salonen, *Die Hausgeräte der alten Mesopotamier nach sumerischen und akkadischen Quellen*, AASFB 144
SAKI	F. Thureau-Dangin, *Die sumerischen und akkadischen Königsinschriften*
SANE	Studies in the Ancient Near East
SitzHeidAkadWiss	*Sitzungsberichte der Heidelberger Akademie der Wissenschaften*
SKIZ	W. Römer, *Sumerische 'Königshymnen' der Isin-Zeit*
ŠL	A. Deimel, *Šumerisches Lexikon*
SLTNi	S.N. Kramer, *Sumerian Literary Texts from Nippur*, AASOR 23
SMS	Syro-Mesopotamian Studies

SpBTU	H. Hunger, *Spätbabylonische Texte aus Uruk*
SRT	E. Chiera, *Sumerian Religious Texts*
StBoT	*Studien zu den Boğazköy-Texten*
StOr	*Studia Orientalia*
Strssbg	tablets in the collection of the Universitäts- und Landesbibliothek zu Strassburg
Studies Oppenheim	J.A. Brinkman, ed., *Studies Presented to A. Leo Oppenheim*
STVC	E. Chiera, *Sumerian Texts of Varied Contents*
TCL	Textes cunéiformes du Louvre
TCS	Texts from Cuneiform Sources
TDP	*Traite diagnostiques et prognostiques*
Thomsen, *Sumerian Language*	M.-L. Thomsen, *The Sumerian Language*, Mesopotamia 10
Thureau-Dangin, *RAcc*	F. Thureau-Dangin, *Rituels accadiens*
TIM	Texts in the Iraq Museum
TMB	*Textes mathématiques babyloniens*
TMS	*Textes mathématiques de Suse*, Mémoires de la Mission Archéologique en Iran 34
Toomer, *Almagest*	G.J. Toomer, *Ptolemy's ALMAGEST*
TSŠ	R.R. Jestin, *Nouvelles tablettes sumériennes de Šuruppak conservées au Musée de Stamboul*, Bibliothèque archéologique et historique d'Institute français de archéologie d'Istanbul, 2
TuM	Texte und Materialien der Frau Professor Hilprecht Sammlung vorasiatischer Altertümer im Eigentum der Friedrich-Schiller-Universität Jena
UET	Ur Excavations, Texts
UF	Ugarit-Forschungen
UM	tablets in the collections of The University Museum
UVB	Vorläufiger Bericht über die . . . Ausgrabungen in Uruk-Warka
VAS	*Vorderasiatische Schriftdenkmäler der Königlichen Museen zu Berlin*
VAT	tablets in the collections of the Staatliche Museen, Berlin
VDI	*Vestnik drovnij istorii*
VIO	Veröffentlichungen des Instituts Akademie Wissenschaften
Wilcke, *Kollationen*	C. Wilcke, *Kollationen zu den Sumerischen literarischen Texten aus Nippur in der Hilprecht-Sammlung Jena*

WO	*Die Welt des Orient*
WVDOG	Wissenschaftliche Veröffentlichen der Deutschen Orient-Gesellschaft
Wycherley, *Cities*	R.E. Wycherley, *How the Greeks Built Cities*
WZKM	Wiener Zeitschrift für die Kunde des Morgenlandes
YBC	tablets in the collections of the Yale Babylonian Collection
YNER	Yale Near Eastern Reseaches
YOS	Yale Oriental Series
ZA	*Zeitschrift für Assyriologie*

Assyrian Scholarly Texts in the Yale Babylonian Collection

GARY BECKMAN AND BENJAMIN R. FOSTER

The Yale Babylonian Collection possesses a group of thirty-three Assyrian fragments, which were apparently acquired in one purchase sometime prior to 1920.[1] The majority, if not all, of these fragments seem to belong together. In 1933, F. J. Stephens published two of these pieces in YOS 9: YBC 7128, fragment of an Assurbanipal cylinder (No. 78), and YBC 7133, fragment of a prism of the same king (No. 79). We present the others here, having reduced the remaining inventory numbers to twenty-seven through joins.[2] The material includes historical, lexical, medical, and magical texts of various types.

The provenience of the fragments is uncertain, but two lines of evidence support Assur. First, No. 2 is a piece of the Middle Assyrian palace edicts, all previously published exemplars of which were found at Assur.[3] Second, No. 7 joins BAM 28, a text reportedly from Assur.[4] In addition, the colophons of this tablet and of No. 24 mention exorcists of the temple of the god Assur.[5] No. 7 was

1. We thank W. W. Hallo, Curator of the Yale Babylonian Collection, for permission to publish this material. We also wish to express our gratitude to the following scholars, who left notes with the tablets, or who read our preliminary copies and sent us corrections, identifications, duplicates, and parallels: T. Abusch (No. 9b), R. Borger (Nos. 4, 22, and helpful comments on other pieces), M. Civil (No. 3), A. Goetze (No. 5), A. K. Grayson (Nos. 1, 7, 10), W. G. Lambert (Nos. 2, 9, plus helpful comments on other pieces), E. Reiner (Nos. 6, 9, 12, plus helpful comments on other pieces), and W. von Soden (Nos. 2, 4, 5, 7 [including join], 9, plus helpful comments on other pieces). We are particularly indebted to F. Köcher for many important observations on the medical fragments. To him we owe the joins which permit the reconstruction of No. 9. Unfortunately it was not possible to re-do the copies in light of this information. Various passages were collated by M.J. Geller, who contributed some suggestions and corrections to several of the copies.

2. YBC 7136 and 7137 are unrelated.

3. See E. Weidner, *AfO* 17 (1954-56) 265-66, and O. Pedersén, *Archives and Libraries in the City of Assur*, 1 (Uppsala, 1985), p. 34.

4. *Die babylonisch-assyrische Medizin in Texten und Untersuchungen*, 6 vols. (Berlin, 1963-) 28 = EHE 333, from the collection of E. Tisserant; see V. Scheil, *RA* 18 (1920) 16. This join was confirmed by means of a plaster cast prepared by Ulla Kasten which Foster was able to join to EHE 333, courtesy of J.-M. Durand. Collation shows that the last sign in rev. 18′ of *BAM* 28 is correctly copied, being DINGIR over an erasure. Most of this line appears to have been written over erasures.

5. No. 7: GIM SUMUN-*šú šà-ṭir bà-ri* [*ḫ*]*a-an-ṭiš na-àṣ-ḫa* / [*ú-il-t*]*i*$^{?}$ ^{m}*ki-ṣir-*^{d}A[G ^{L}]^{U}MAŠ.MAŠ É AN.ŠÁR.

No. 21: [LIBIR.RA.B]I GIM AB.SAR BA.AN.Ê.A / [DUB ^{m}*Ki-ṣir* $^{?}$-A]N.ŠÁR / [. . .] *la ta-pa-šiṭ*.

the property of Kişir-Nabu, and the personal name in No. 21 is probably to be restored as [Kişir-]Assur.[6] These two individuals, nephew and uncle respectively, were prominent members of the scribal family whose tablets were uncovered in the "Haus der Beschwörungspriester" (quadrant hD8I) at Assur.[7] Nos. 7 and 21, as well as other of our fragments, seemingly belonged to the private library found in this house.[8] It is interesting that the British Museum acquired a number of Assur texts from I. E. Géjou in 1911,[9] and that A. T. Clay, founder of the Yale Babylonian Collection, made significant purchases from the same Parisian dealer. A perusal of the Clay-Géjou correspondence, however, turned up no recognizable reference to the texts studied here.

With the exception of Nos. 2 and 14 (and possibly Nos. 16 and 19), which display Middle Assyrian script, all of the Yale fragments are first-millennium in date. The three historical texts (No. 1 and the two pieces published by Stephens) date to the reign of Assurbanipal, while Kişir-Assur and Kişir-Nabu were active in the second half of the seventh century.[10]

We present these fragments in the hope that they will prove useful in reconstructing the series to which they belong. We wish that we could have discussed these pieces with A. Sachs, whose epigraphic skills, erudition, and generosity were the awe of master and apprentice alike, and whose tact and gentle personality made him the friend and mentor of Assyriologists *şeḫer rabi*.

CONCORDANCE

YBC	*No.*	*YBC*	*No.*	*YBC*	*No.*
7114	4	7125	10	7138	21
7115	5	7126	9c	7139	9d
7116	1	7127	11	7140	16
7117	20	7128	YOS 9 78	7141	21
7118	6	7129	12	7142	17
7119	20	7130	24	7143	18
7120	7	7131	13	7144	22
7121	23	7132	14	7145	19
7122	8	7133	YOS 9 79	7146	9b
7123	9a	7134	15	7147	20
7124	21	7135	3	7148	2

6. H. Hunger, *Babylonische und assyrische Kolophone*, AOAT 2 (Neukirchen-Vluyn, 1968), pp. 146-56, lists among scribes and owners of tablets only four individuals whose names end in the divine name Assur: Arad-Assur, Mutaqqin-Assur, SAR-x-Assur, and Kişir-Assur. Of these persons, only the last bears the professional designation ^{LÚ}MAŠ.MAŠ, and he alone is attested with any frequency—more than forty times.

7. See G. Meier, *AfO* 12 (1937-39) 225-26.

8. On this material see S. Parpola, *JNES* 42 (1983) 10, and Hunger, *Kolophone*, p. 19 and entries 197-207. As demonstrated by Weidner, *AfO* 12 (1937-39) 147, other material from this locus went astray into the art market. Compare also B. Meissner, ZA 34 (1922) 113; C. Preusser, *Die Wohnhäuser in Assur*, WVDOG 64 (Berlin, 1954) 58; and O. Pedersén, CRRAI 32, pp. 145-46.

9. See A. K. Grayson, ARRIM 1 (1983) 17.

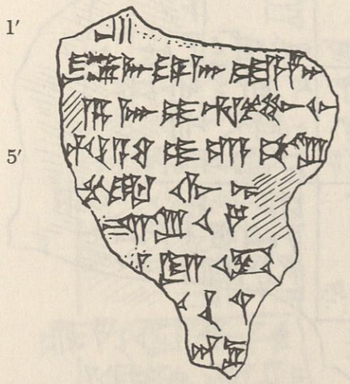
10. See Meier, *AfO* 12 (1937-39) 226.

CATALOGUE

Number	*YBC Number*	*Dimensions (cm)*	*Description*
1	7116	4.3 × 3.9	royal inscription: = Streck, *Asb.* 2, p. 90 lines 108-14; Aynard, *Prisme*, pp. 62ff. lines 61-68
2	7148	8.5 × 9.2	palace edicts: = VAT 14407 (*AfO* 17 [1954-56] Tf. XII) obv. 6-19 (lines 35-48 of edition, pp. 273-76); other side lost and piece smoothed flat, c. 1 cm thick
3	7135	4.0 × 4.5	syllabary: obv. = Idu II 105ff.; rev. = Idu II 320-31
4	7114	2.2 × 4.0	*šammu šikinšu*: cf. Köcher, *Pflanzenkunde* 33-35; *BAM* 327
5	7115	3.1 × 4.4	list of plants: obv. = CT 14 23 i 1ff., with addition of one entry between 7 and 8; *Therapeutic Vademecum* 5 i 1-7;10;8-9 (Köcher), to appear in *BAM* 9
6	7118	4.0 × 2.2	medical: rev. // *BAM* 311:41′-46′
7	7120	4.0 × 4.2	extracts from medical texts: join to *BAM* 28 (obv. 1-8, rev. 13′-18′); read rev. 14′ [É]N AN.TA BA.MUL KI.TA ⌜BA⌝.MUL⌝ ḪUL NAM.LÚ.ULÙ[.LU]; cf. also *BAM* 533 and 543.
8	7122	4.5 × 4.8	medical; colophon: SAG.DU *ṭup*⌝-*pī*⌝ x x x NÍG.GIG x [. . .]
9a	7123	4.2 × 5.0	
9b	7146	6.5 × 7.3	
9c	7126	2.9 × 6.0	
9d	7139	5.6 × 4.6	Catalogue of medical texts, with numerous references to Sumerian incantations. 9a is the upper right-hand corner of the tablet, and 9b and 9d, while not joining directly, present successive portions of the right edge. 9c, which is a piece of the left edge, preserves the beginning of lines which find their completion on 9d. Thus, for the obverse, 9c obv. 14′ = 9d obv. 10′ (NIGIN 5 DU[B.MEŠ . . .] MURUB$_4$.MEŠ-*šú* KÚ.MEŠ-*šú šá* DÚR.GIG.GA.KAM), and on the reverse 9c rev. 7′ = 9d rev. 18 (DIŠ DIB ^{d}A-*nim* [BÚR DIŠ NA *gi-na*]-*a šu-dur*) 9a read rev. 4′ with von Soden *um-mu-*⌜*ra*⌝ (D of *emēru* also in 9d obv. 18′); for the obscure scribal term SUR.GIBIL

Number	*YBC Number*	*Dimensions (cm)*	*Description*
			ṣab-tu, see *CAD* s. v. *zarû* B; for the third line of the colophon read possibly LÚ?-^{d}*Ba-ú šá* SANGA? URU?.BAL.TIL^{ki} 9d: to obv. 12′ cf. *BAM* 131 rev. 9′; to rev. 24′ cf. *KAR* 44 rev. 2.
10	7125	5.3 × 3.6	medical: = *CT* 23 10 iii 17-24
11	7127	4.5 × 2.3	medical: obv. = *BAM* 580 v′ 18′-20′; rev. // *AMT* 5 1:5ff.
12	7129	5.0 × 2.0	medical: obv. ii 1-4 // *BAM* 168:62-66
13	7131	4.4 × 4.5	medical: obv. 1′-3′ cf. *BAM* 134 ii 16-18; rev. cf. *BAM* 431 iv 43-46
14	7132	6.0 × 4.5	medical: cf. *BAM* 311, 315, etc.
15	7134	5.3 × 3.5	*suālu* tablet I: = *BAM* 574 iii 61-64
16	7140	4.9 × 5.8	medical
17	7142	6.4 × 6.9	medical
18	7143	6.2 × 5.2	medical; in rt. col. 7′ note Ú AB.DUḪ for usual Ú ÁB.DUḪ
19	7145	4.4 × 7.2	medical
20	7117+7119 +7147	8.1 × 13.3	incantation: cf. Gurney, *AAA* 22 (1935) 42
21	7124+7138 (+)7141	8.1 × 7.0; 8.2 × 5.1	incantation and ritual: cf. *AAA* 22 56 i 45ff.; due to relative thickness cannot belong to same tablet as No. 20
22	7144	6.9 × 6.4	possibly a "mystical explanatory work"; rev. 3′-5′ cf. *KAR* 307:25-27
23	7121	5.0 × 3.0	unidentified; fragment of exceptionally thick (3 cm), large tablet; text in Assyrian dialect (*er-ra-bu-ú-ni*, *kam-mu*$^{!}$-*su*); second sign in line 1 is puzzling—perhaps the scribe wrote *i*, then, dissatisfied with the spacing, extended the sign to the left without fully erasing the left side of the first *i*
24	7130	7.0 × 3.0	unidentified

No. 1



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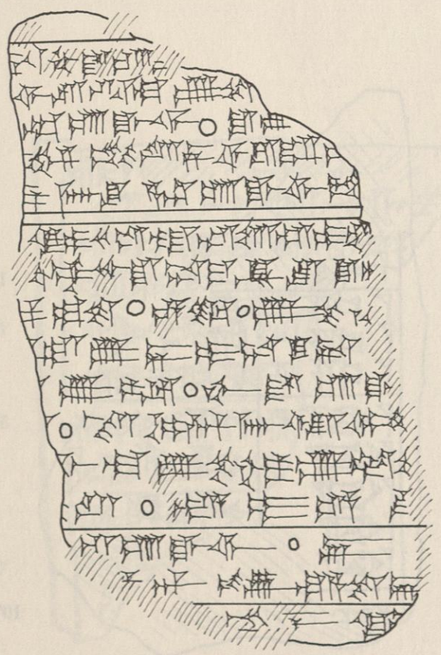

other side lost

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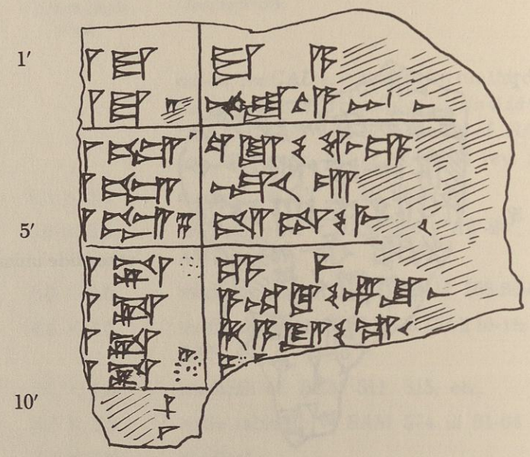
obv.



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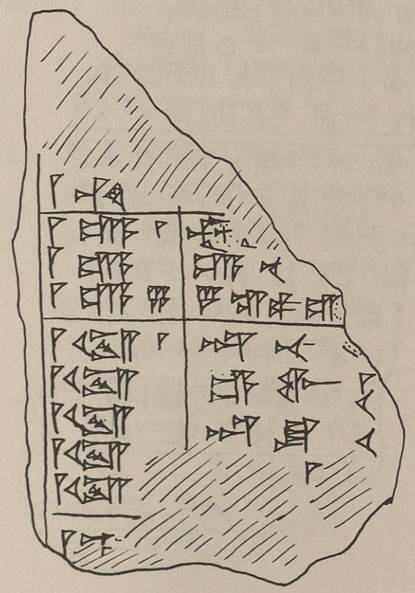

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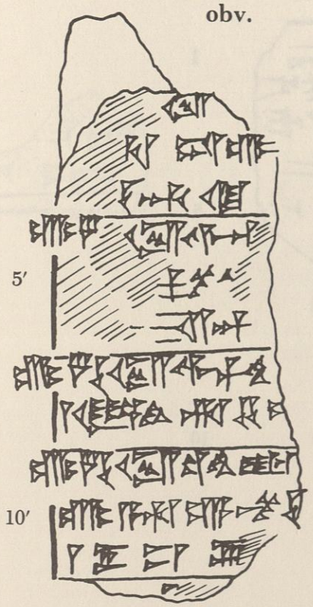
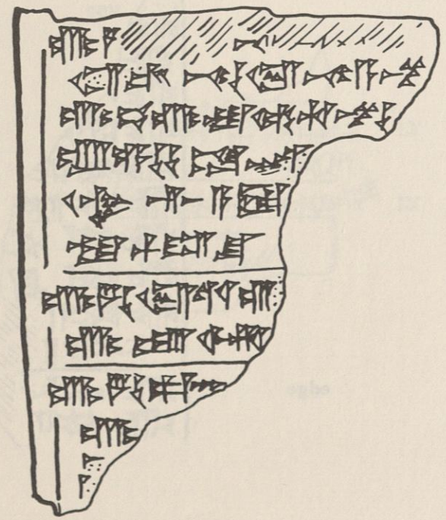


rev.



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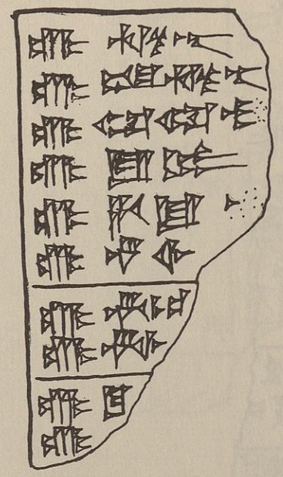
obv.



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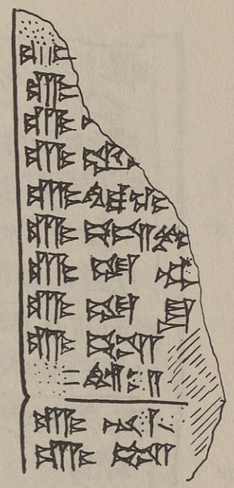
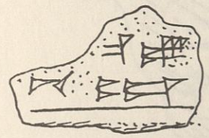


edge

No. 6

obv.



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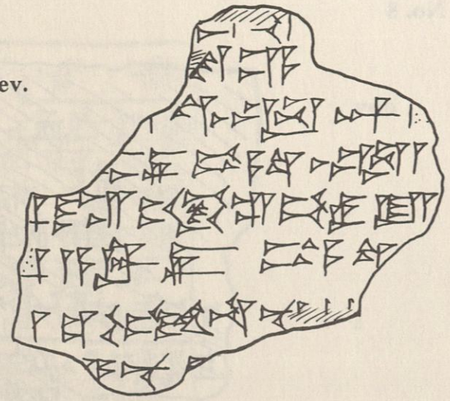

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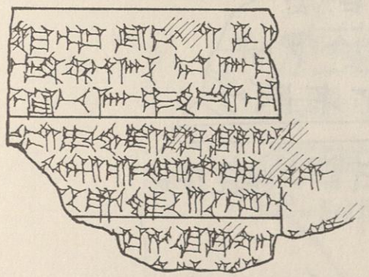

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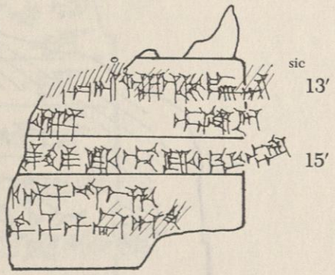

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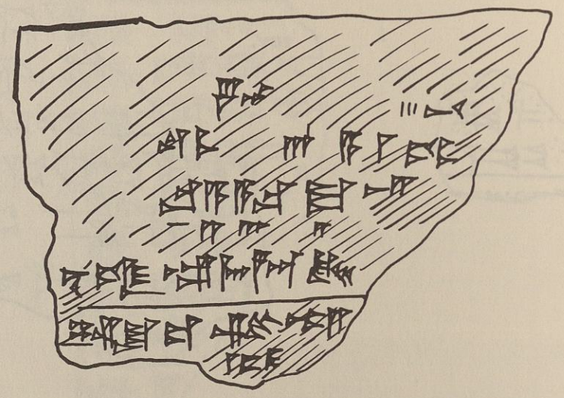
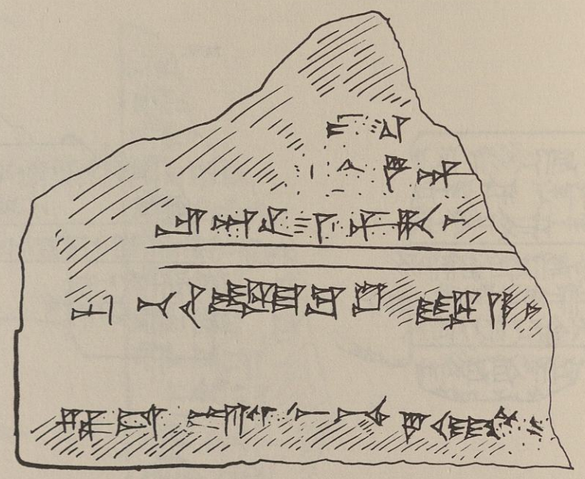


5′

rev.



5′

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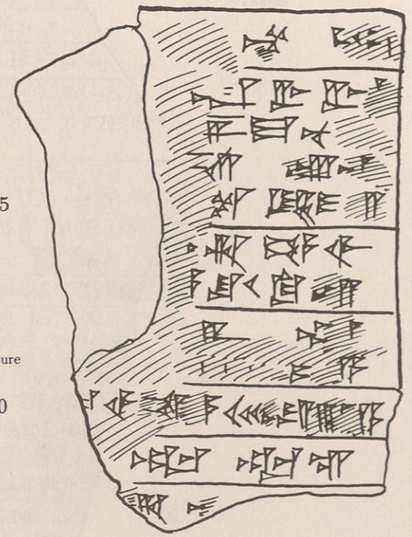
obv.

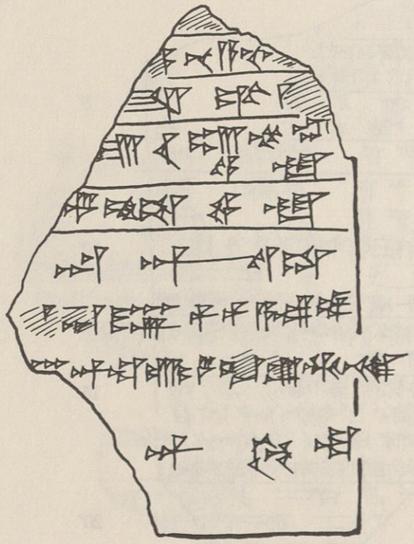


5

erasure

10

rev.



5′

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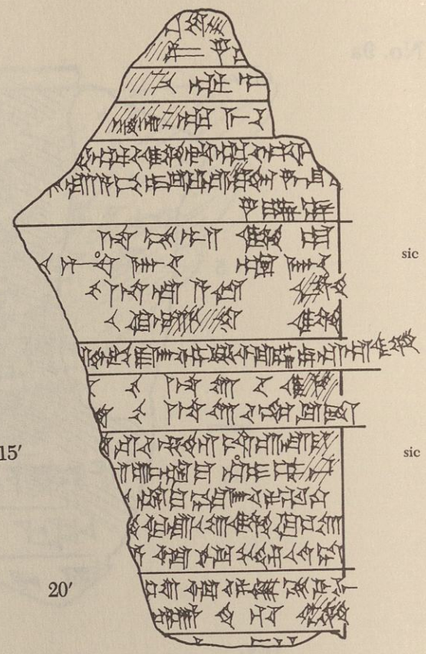
obv.



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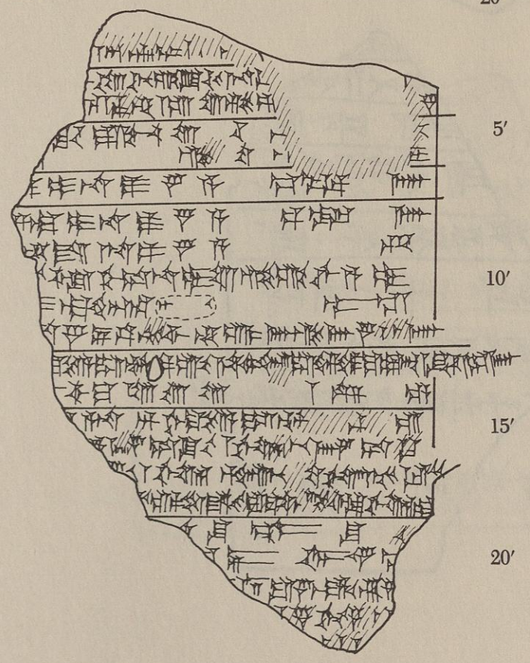

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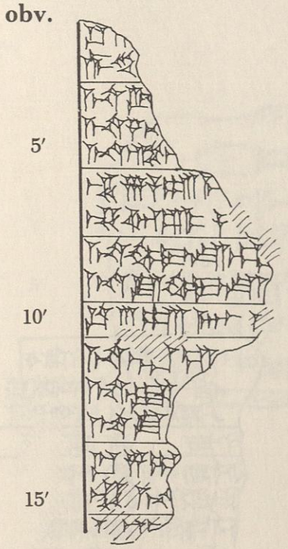

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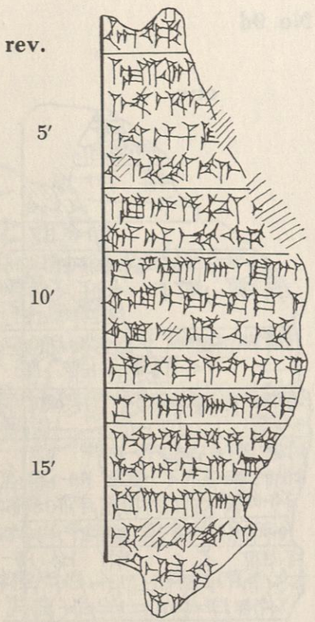

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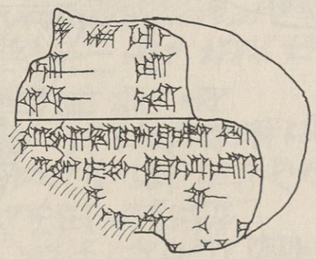

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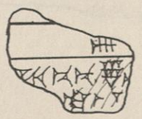

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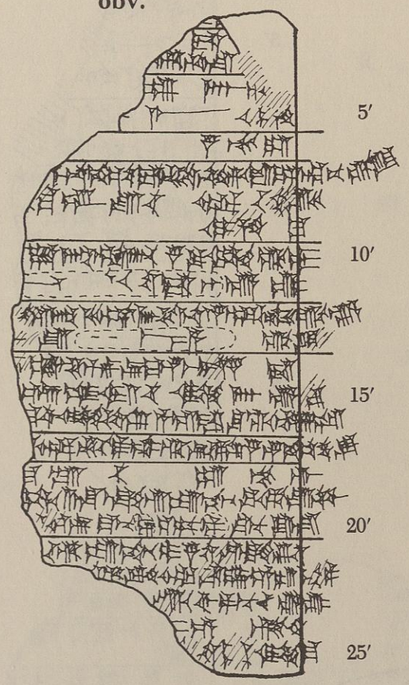

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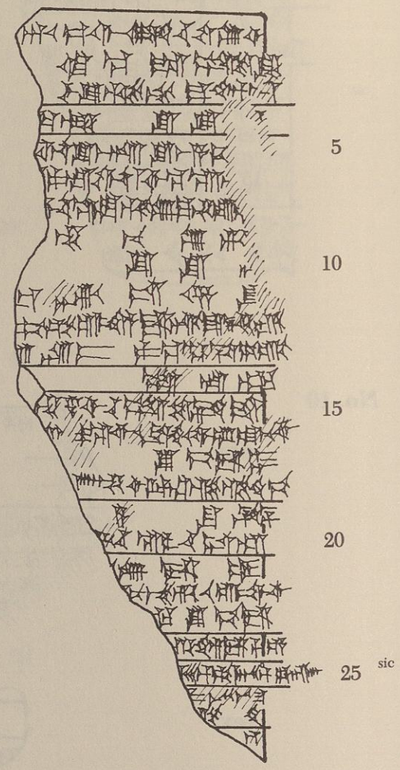

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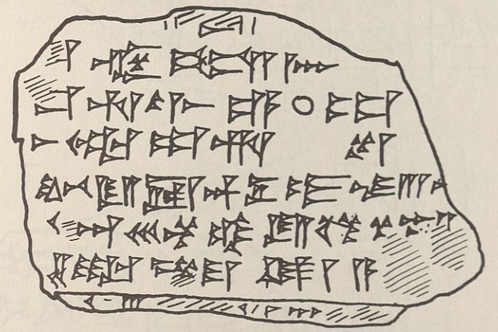

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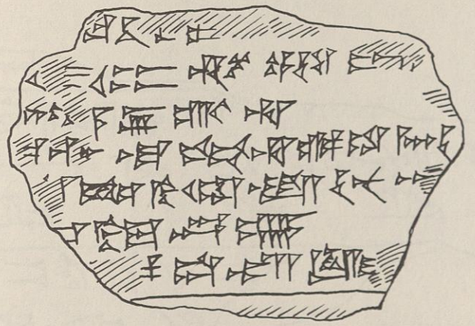

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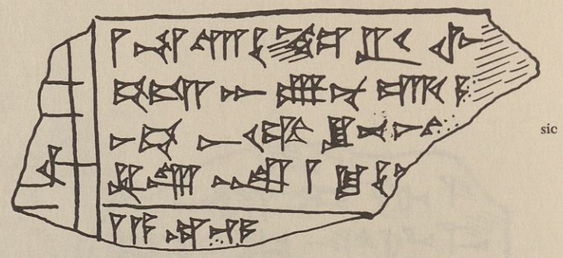
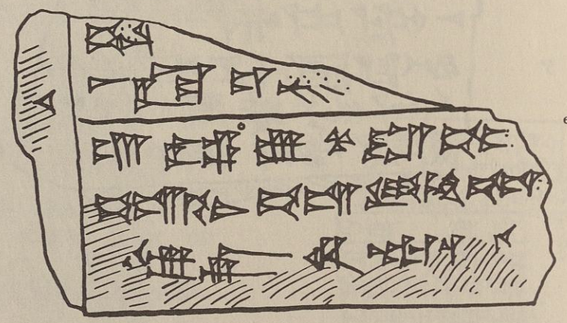
obv.



sic

rev.



erasure

No. 14

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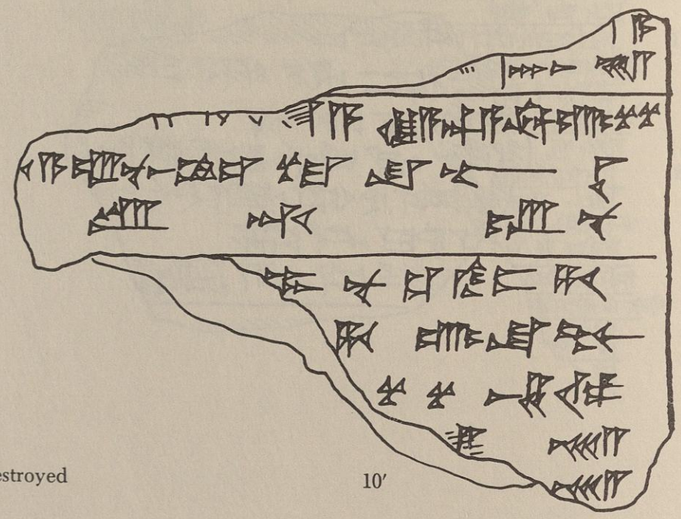


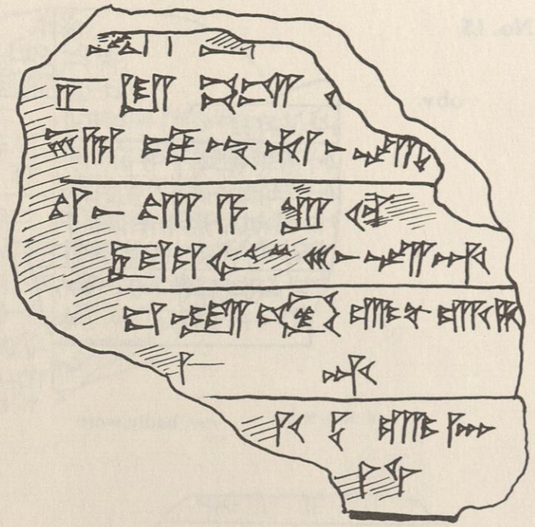
5′

rev. destroyed

10′

No. 13

obv.



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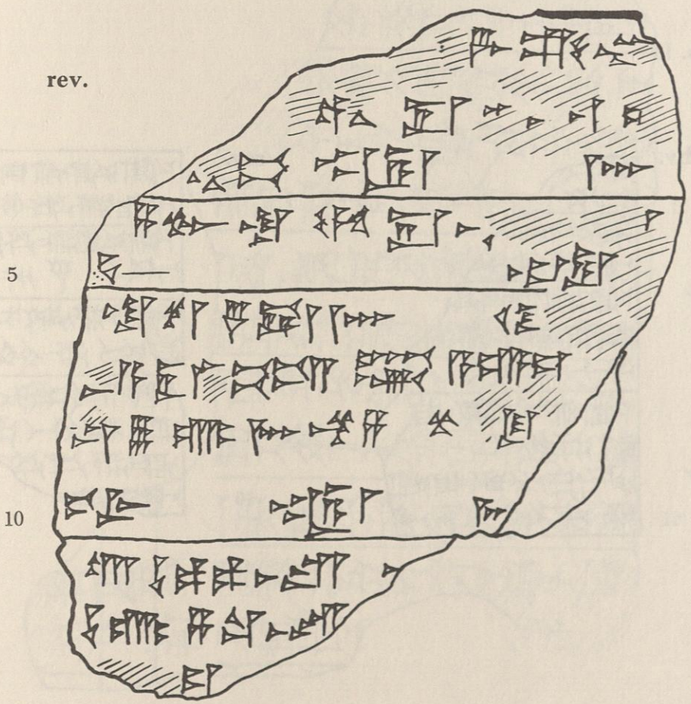
rev.

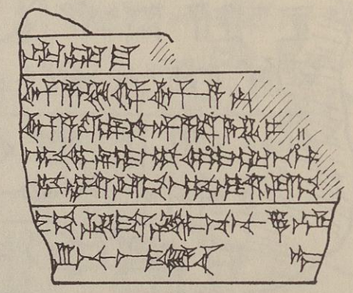


5

10

No. 15

obv.



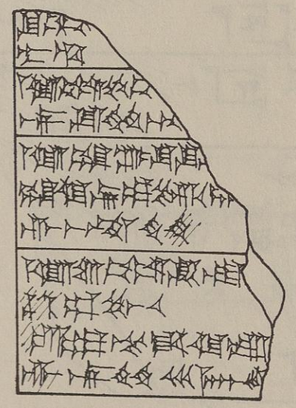
5′

sic

rev. badly worn

No. 16

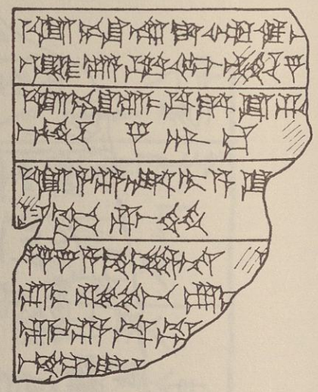
obv.



5′

10′

rev.



5

10

No. 17

5′

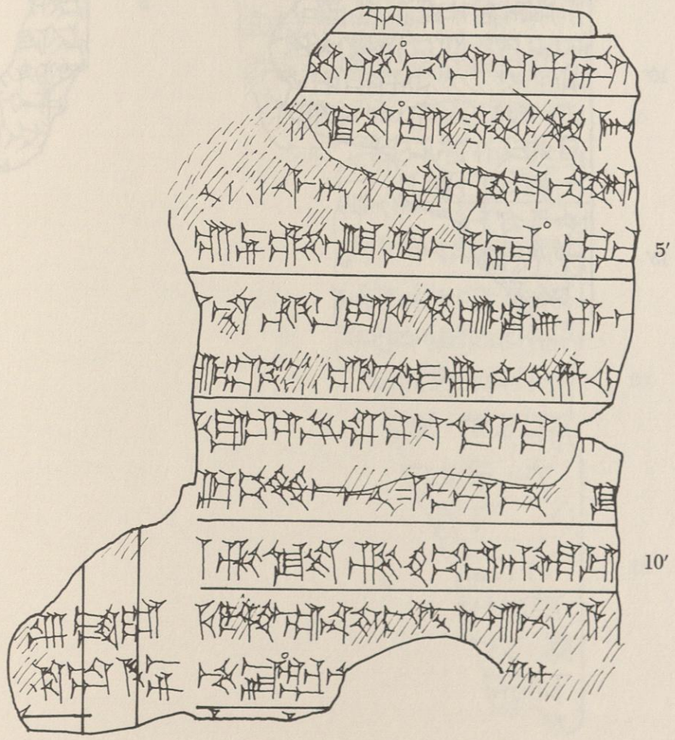
5′

10′

10′

other side lost

No. 18



sic

sic

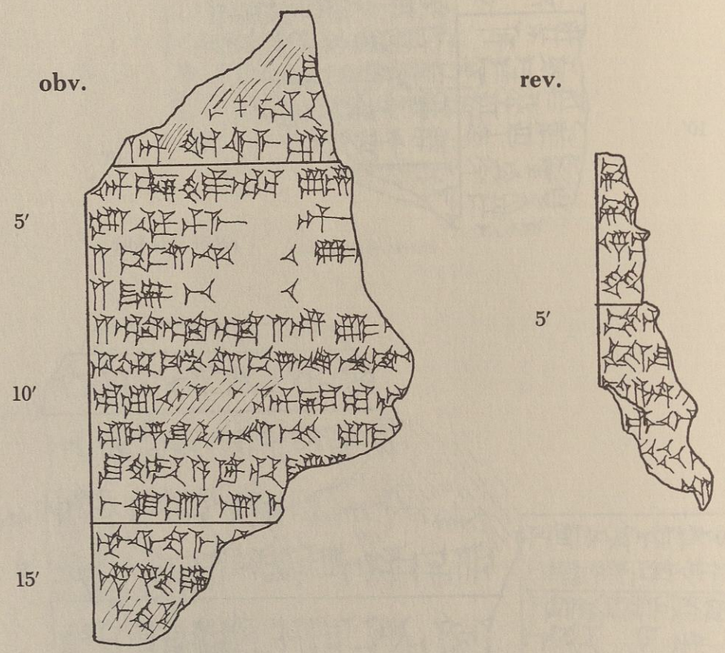
5′ sic

10′

other side lost

sic

No. 19



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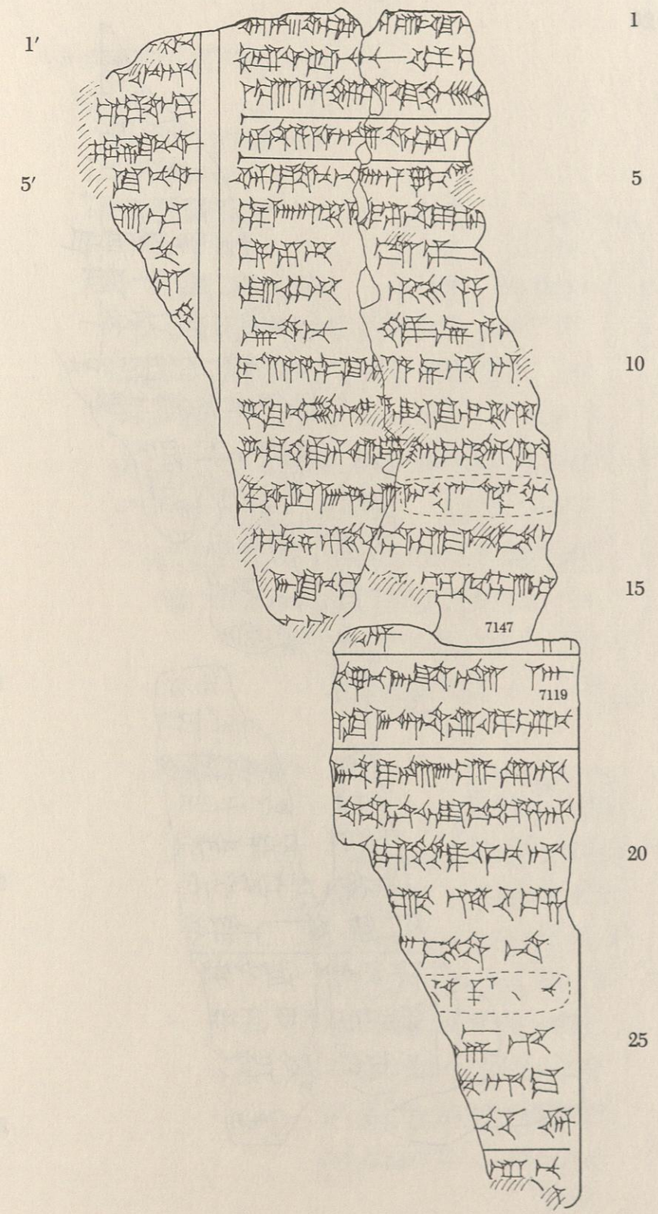
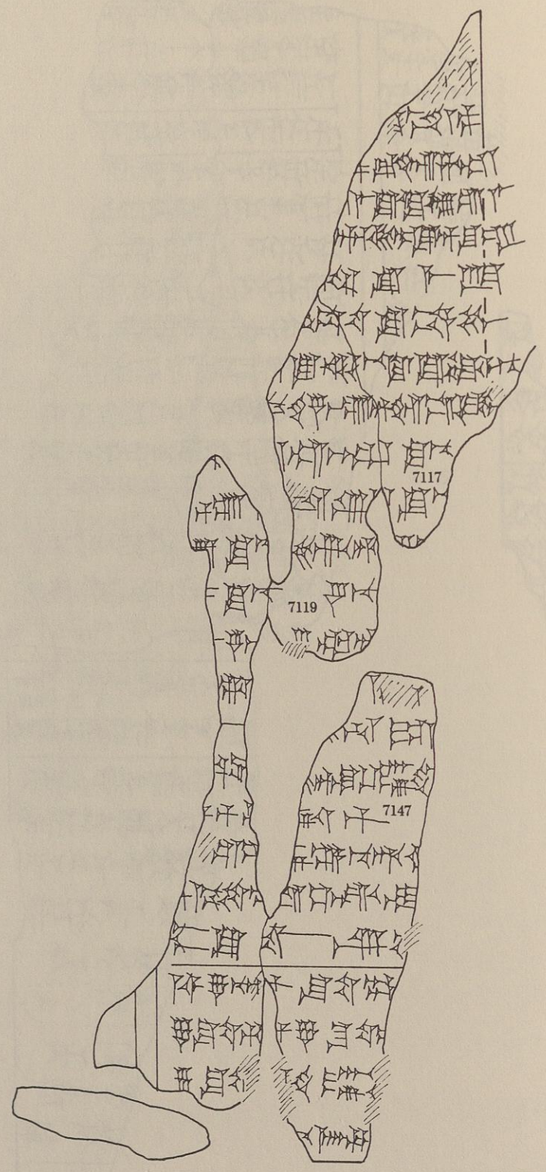


No. 20

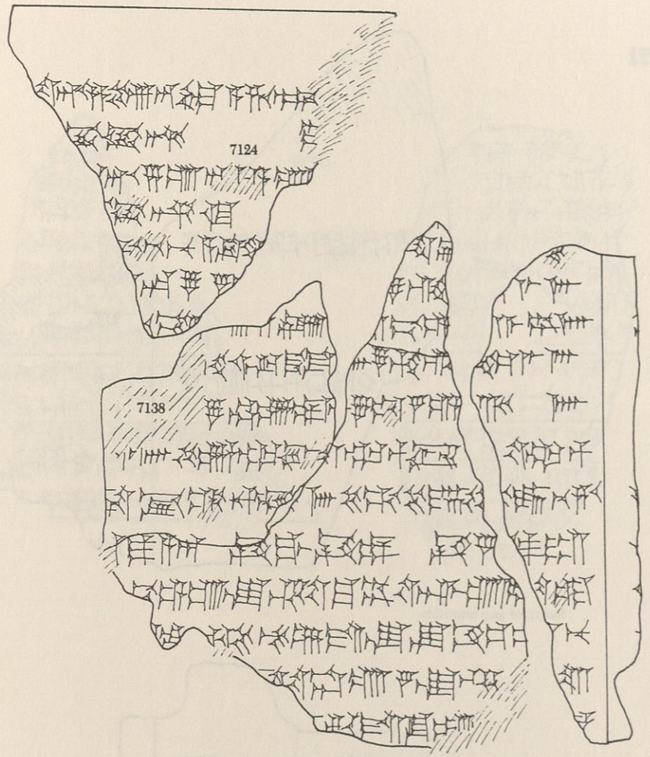
rev.



1′
5′
10′
15′
20′
25′

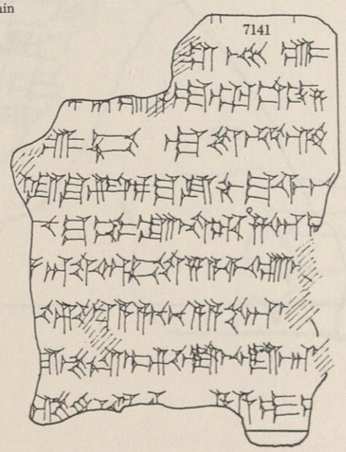
No. 21

obv.



1
5
10
15

17′ length of gap uncertain

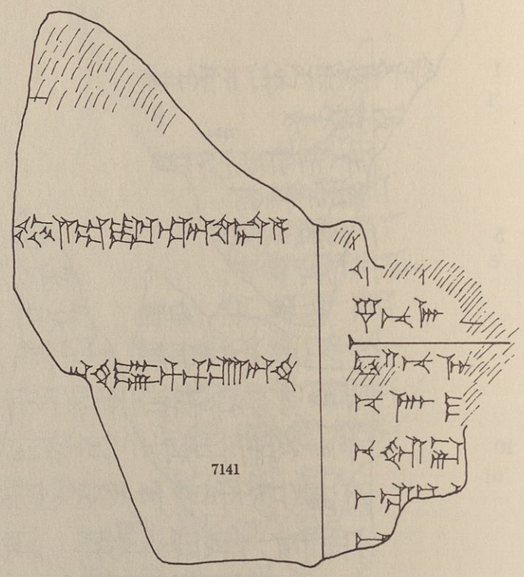


20′

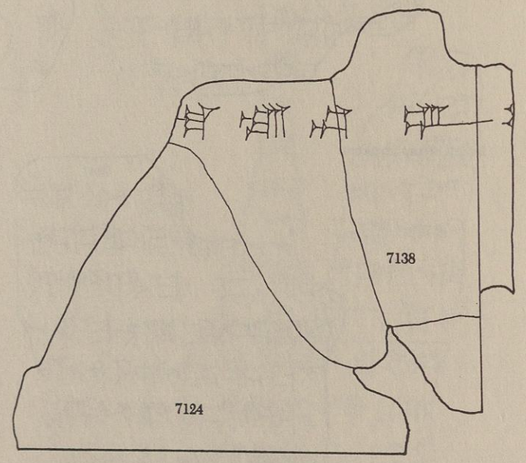
sic

No. 21

rev.



length of gap uncertain



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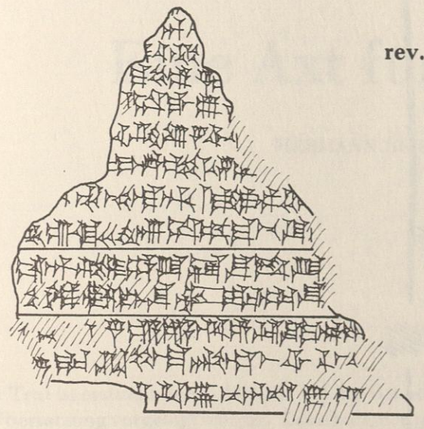
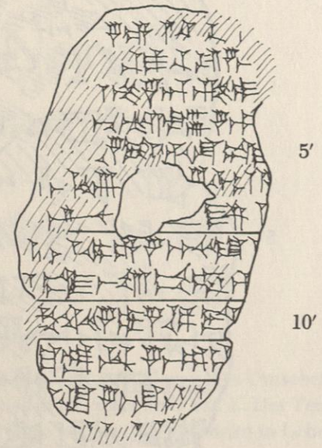
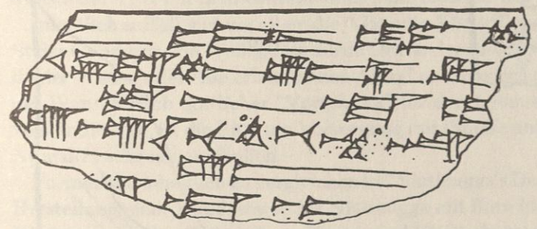


rev.



No. 23

obv.



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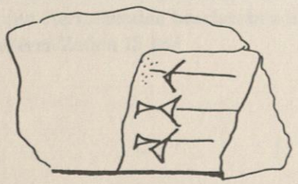
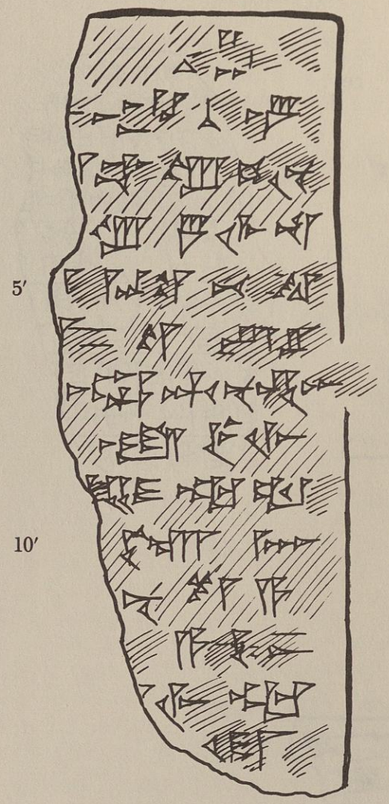
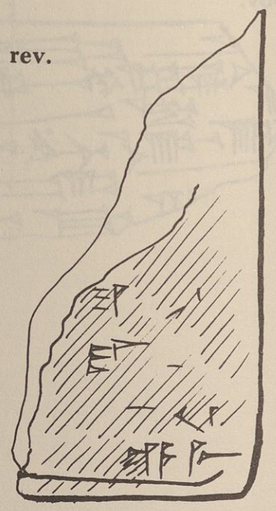


No. 24



rev.



Eine Axt für Nergal

HERMANN BEHRENS

Der Text ist erstmals von C. Wilcke[1] auf der Grundlage von Text A, F, G und H in Umschrift und Übersetzung vorgelegt worden. Dazu kommen jetzt neu die Texte B, C, D und E. Der Text, der die Herstellung einer dem Nergal geweihten Axt mit Bitte für den Herstellenden in Leben und Tod beschreibt, ist in mehrfacher Hinsicht bemerkenswert.

Die Textüberlieferung in acht Exemplaren (ingesamt aus Nippur) deutet auf einen Gebrauch des Textes in der Schule.

Der Text ist entweder eine Weihinschrift mit unüblichen persönlichen Bitten, in diesem Fall vom Original abgeschrieben, oder als Übungsbeispiel für den Schulgebrauch im Stil einer Weihinschrift entworfen worden.

Die Syntax des Textes ist akkadisch beeinflusst, nach der Syntax sumerischer Weihinschriften müsste der Text mit dem Gottesnamen (und Titulatur des Gottes) beginnen.

Inhaltlich auffällig ist vor allem die "Garantie-Klausel" gegen Beschädigung und Verlust. Auch ist der Gebrauch von Weihgaben durch Dritte, der nach Z. 9 anzunehmen ist, sonst nicht belegt, da der Wunsch des "nie erlahmenden Arms" nur schwerlich einem Gott gelten kann. Während der Wunsch nach göttlicher "Vorsehung" für den Lebenden in unserem Zusammenhang gut verständlich ist, ist die Bitte um Versorgung mit (Speise und) Trank nach dem Tode als Bitte an Nergal(?) sehr ungewöhnlich.

Formal und inhaltlich zu vergleichen ist "Nintinugga's Dog," ein Text von 18 Zeilen, in dem die Herstellung einer Hundestatue für Nintinugga mit Bitte für den Herstellenden beschrieben ist. Die letzten beiden Zeilen dieses Textes sind identisch mit unseren Zeilen 15-16.[2]

1. *Das Lugalbandaepos*, (Wiesbaden, 1969), S. 58 Anm. 210.

2. S. dazu A. Ali, Sumerian Letters: Two Collections from the Old Babylonian Schools (Unpub. Ph.D. diss., University of Pennsylvania, 1984), S. 144ff. und CBS 14115:1-4 (Vs. vollständig, Rs. unbeschrieben; wohl Exzerpt zu "Nintinugga's Dog"; s. die Kopie Abb. 2):

1 nam-gur$_4$-zu ki-zu ì-kin-gá
2 KA×LI(tu$_6$)-ni lú-sa$_6$ / mu-šè mu-un-sa$_4$
3 u$_4$-ti-la-gá / igi ḫu-mu-un-du$_8$
4 u$_4$ ba-ug$_7$(TIL)-en kur-ra / a-si-ga ḫu-mu-un-nag-n[ag]

Textzusammenstellung

A TuM NF 4, 45 Z. 1-14; Rs. Z. 1-2 = 1-16
(kollationiert bei Wilcke, *Kollationen zu den Sumerischen literarischen Texten aus Nippur in der Hilprecht-Sammlung Jena*, S. 74)

B IM 58417 (3 N-T 310) Z. 1-8; Rs. Z. 1-2 (Abguss UM) = 1-16

C UM 55-21-327 Z. 1-10; Rs. Z. 1 (Kopie Abb. 1) = 1-16

D ISET 1, Taf. 149 Ni. 4574 b Z. 3-10 = 1-12

E OPBF 4 70 3N-T 916, 339 Z. 1′-11′ = 2-16

F Ali, Letters, Tafel 40 CBS 14049 + N 864 i Z. 1′-12′ = 3-16

G SLTNi 131 Rs. i Z. 1′-5′ = 9-16

H PBS 15 65 Rs. Z. 1-3 = 14-16

Umschrift

1.	A 1	nibru- ki-ta- lú
	B 1a	nibru- ki-ta- lú
	C 1	[ ]-ki-ta-[ ]
	D 3a	nibru -ki-ta- lú
2.	A 2	dumu- lugal-šuba dam-gàr-ra
	B 1b	dumu- lugal-šuba dam-gàr
	C 2	[ ]-lugal-šuba d[am-]
	D 3b	dumu -lugal-šuba dam-gàr-ra-ke$_4$
	E 1′	[ ] ⌜dam⌝-[ ]
3.	A 3	^{d}nergal-ra
	B 2a	^{d}nergal-ra
	C 3a	⌜^{d}⌝nergal-r[a]
	D 4a	^{d}nergal-ra
	E 2′	[n]erga[l-]
	F i 1′	[ ] ⌜x⌝ [ ]
4.	A 4	ḫa-zi-in-an-na mu- na-ni-in-dím
	B 2b	ḫa-zi-in-an-na mu-un-na-ni-in-dím
	C 3b,4	urudu-ḫa-zi-in-an-n[a] mu- na-ni-in-dím
	E 3′	[ ] mu- na-[ ]
	F i 2′	[ ] mu- na-n[i]

5.	A 5	giš- bi ar-ga-nu-um-ḫur-sag-gá
	B 3a	giš- bi giš- ar-ga-nu-um-ḫur-sag-gá
	C 5a	giš- bi giš- ar-g[a-]
	D 5a	[ ] ⌜giš⌝- ar-g[a-]
	F i 3′	[gi]š-[bi] ar-ga-n[u?]
6.	A 6	a- làl- e diri-ga-àm
	B 3b	e- làl- la diri-ga-àm
	C 5b	a- làl- e diri-ga-àm
	D 5b	a⌝- làl⌝-e ⌜a⌝ diri-ga-àm
	E 5′	⌜x⌝-làl- e [ ]
	F i 4′	⌜a⌝-làl- e SI.⌜A⌝-[ ]
7.	A 7	na$_4$ - bi an-ta-sur-ra
	B 4a	na$_4$ -[bi] na$_4$-an-ta-sur-ra
	C 6a	na$_4$ - bi an-ta-sur-ra-àm
	D 6a	na$_4$ - bi an-ta-sur-ra-àm
	E 6′	[ ]- bi an-t[a-]
	F i	(omittit)
8.	A 8	gaba- ri nu-tuku-àm
	B 4b	⌜gaba⌝-ri nu-tuku-àm
	C 6b	gaba- ri nu-tuku-àm
	D 6b	gaba- ri nu-tuku-àm
	E 7′	[ga]ba-ri n[u-]
	F i	(omittit)
9.	A 9	ḫe-sìg- ge á- ni na-a[n]-⌜kúš-ù⌝
	B 5	ḫé-sìg-⌜ge á⌝-ni na-an- kúš-ù
	C 7	ḫé-sìg- ge á- ni na-an- kúš-ù
	D 7	⌜x x- ge⌝ á- ni na-an- kúš-ù
	E	(omittit)
	F i 5′	[-s]ìg-ge á- ni n[a-]
	G Rs. i 1′	[ ]-ge ⌜á⌝-[ ]
10.	A 10	ḫé- éb- ta- TAR- e
	B 6a	ḫé-⌜éb⌝-[ ]-TAR- e
	C 8a	ḫé- éb- ta- TAR- e
	D 8	[ ]- e-en
	E 8a′	[ ]-éb- ta- TAR-⌜e⌝
	F i 6′	[ ]-ma⌝- an- TAR-⌜e⌝
	G Rs. i 2′a	ḫé- eb- ta- TAR- a

11. A 11 ga- mu-na-ab-silim
B 6b ga- mu-na- x(TAR?)
C 8b ga- mu-na- silim
D 9 [ ]-an-silim
E 8b′ [ ]
F i 7′ [g]a-mu-na-ab-silim
G Rs. i 2′b ga-[ ]

12. A 12 ú- gu ḫé- ni-ib-dé-⌜e⌝
B 7a ⌜ú- gu⌝ [ ]-ni-íb-dé- e
C 9a ú- ⌜gu⌝ ḫé- ni-ib-dé-⌜e⌝
D 10 [ ]-e
E 9a′ [ ]- gu ḫé- ni-ib-[ ]
F i 8′ [ ]- gu ḫé- ni-ib-dé- e
G Rs. i 3′a ú- gu ḫé- ni-ib-d[é]

13. A 13 ki- bé ga- mu- na- ab- gi_4
B 7b [ ]-⌜bé⌝ ga- mu- na- ab- gi_4
C9b ki- bé [ ]-⌜mu⌝-na-⌜ni⌝-[ ]
E 9b′ [ ]
F i 9′ [ ]- bé ga- na- ab- gi_4
G Rs. i 3′b ki-bi-šè ga- mu-[ ]

14. A 14 u_4- ti- la- gá igi ḫu- mu-un- du_8
B 8 [ ] igi ḫu- mu-un- du_8
C 10 u_4- t[i-l]a-gá igi [ ]-du_8
E 10′ [ ] ⌜ti⌝-la-⌜gá⌝ igi ḫ[u-]
F i 10′ [ ]-⌜la⌝-gá igi ḫu- mu- du_8
G Rs. i 4′ u_4- ti- la- gá igi ḫu- mu-u[n-]
H Rs. 1 u_4- ⌜ti⌝-la- gá igi ḫu- mu-[ ]

15. A Rs. 1 ⌜u_4⌝ ba- ug_7-en kur- ra
B Rs. 1 [ ]-⌜x⌝- en kur- ra
C Rs. 1a u_4 [ ]
E 11a′ [ ] ⌜ba- ug_7-e?⌝ KU_4-⌜x⌝
F i 11′ [b]a-ug_7-en kur- ra
G Rs. i 5′a u_4 ba- ug_7-en ⌜kur⌝- ra
H Rs. 2a u_4 ⌜ba⌝-ug_7-e kur- ra

16. A Rs. 2 a- si- ga ḫu-mu- nag-nag
B Rs. 2 a- si- ga ḫu-mu- un-nag-nag
C Rs. 1b a- si- g[a]
E 11b′ [ ] g[a ḫu-mu- un-nag-nag]
F i 12′ [-i]g_7-ga ⌜ḫu-mu⌝- nag-nag
G Rs. i 5′b a- si-[ ]
H Rs. 2b,3⌜a⌝-si-[ ] ḫu-mu- nag-na[g]

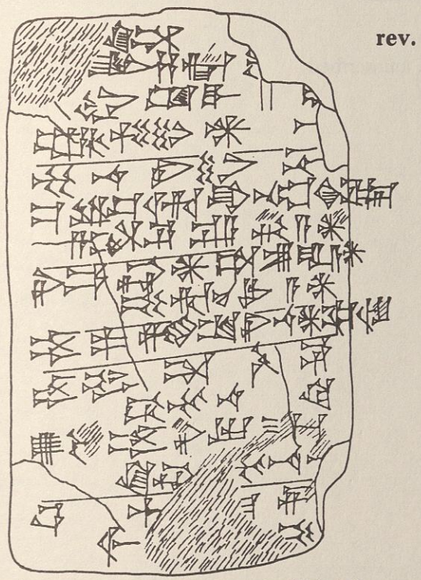
Übersetzung

1 "Nibrutalu,
2 der Sohn des Lugalšuba, des Kaufmanns,
3 hat für Nergal
4 (diese) *ḫazin*-Axt aus Bronze angefertigt.
5 Ihr Stiel ist aus *arganum*-Holz.
6 —Sie überragt . . . .
7 Ihr Erz(?) ist *antasurra*,
8 —Sie hat keinen Widerpart.
9 Wer mit ihr zuschlägt, —sein Arm möge nicht erlahmen.
10 Was immer von ihr abbricht,
11 werde ich ihm (Nergal) wiederherstellen.
12 Wenn sie verloren geht,
13 werde ich sie ihm zurückbringen.
14 Solange ich lebe, möge er nach mir schauen.
15 Wenn ich tot bin, in der Unterwelt
16 möge er mich klares Wasser trinken lassen."[3]

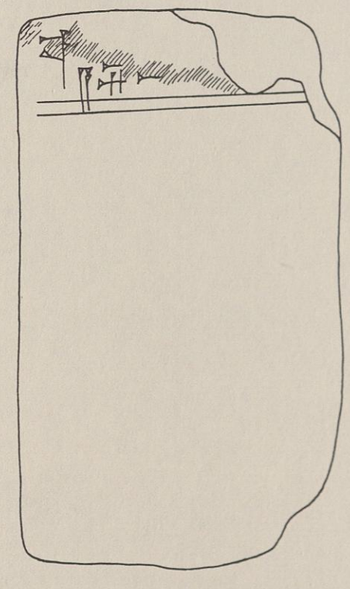
Abb. 1

UM 55-21-327

obv.



rev.

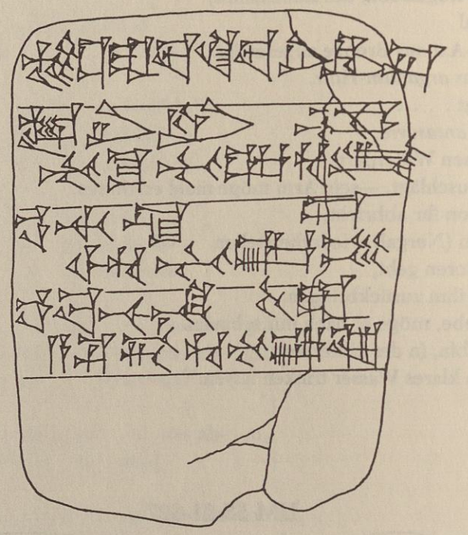


3. si-ga in a-si-ga verstehe ich hier i.S. von *zakû* "rein," "klar."

Abb. 2

CBS 14115

obv.



rev. uninscribed

An Old Assyrian Letter

ROBERT D. BIGGS

The Old Assyrian letter[1] published here might at first glance appear to be an unaddressed letter, though surely it must be "page two" of a longer missive. The names of the addressees (two or more) and the writer are thus unidentifiable and consequently the letter cannot be assigned to any already known commercial archive.

Although the text has many erasures, virtually every sign can be read. However, several emendations seem required, particularly in lines 31 and 49. Word dividers are employed, though not consistently. They are indicated by periods in the transliteration.

Transliteration

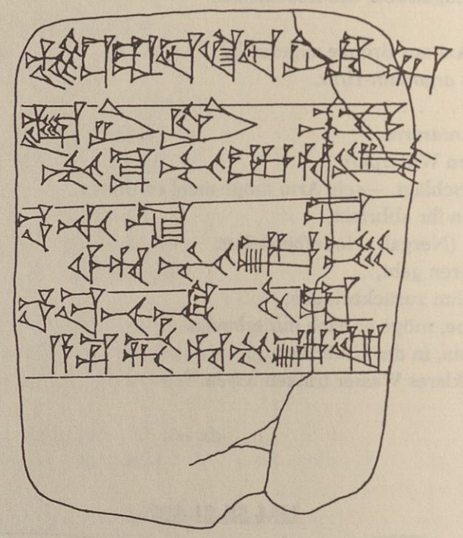
1. 1 *ma-na* KÙ.BABBAR *ṣa-ru-pá-am*
2. *i-šé-pí-šu* . *pá-ni-tim*
3. *Ì-lí-iš-tí-kál* . *ub-lá-ku-nu-tí-ma*
4. 2 *ma-na* KÙ.BABBAR *a-ni-kà-sí-a*
5. 1 *ma-na-um* . ⅔ *ma-na*.TA *a-ša-kán*
6. *ù* 10 GÍN KÙ.BABBAR *a-ni-kà-sí-a*
7. *ta-dí-a ší-tí* . KÙ.BABBAR-*pí-a*
8. ⅓ *ma-na* 7 ½ GÍN 6 *ù* ⅓ TÚG
9. *šu-ru-tim* . *i-ša e-lá-at* ⌜DUMU⌝ *Pá-na-kà* .
10. *a-ni-kà-sí-a ta-dí-a* . 18 GÍN

1. The tablet is in the collection of Dr. and Mrs. Irving Burton of Detroit. I am most grateful to them for lending me the tablet for an extended period while I studied it and for their permission to publish it here. I am very much indebted to Professors Mogens Trolle Larsen and Klaas Veenhof for numerous corrections and suggestions.

Abb. 2

CBS 14115

obv.



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7. *ta-dí-a šī-tí* . KÙ.BABBAR-*pí-a*
8. ⅓ *ma-na* 7 ½ GÍN 6 *ù* ⅓ TÚG
9. *šu-ru-tim* . *i-ša e-lá-at* ᶠDUMUᵀ *Pá-na-kà* .
10. *a-ni-kà-sí-a ta-dí-a* . 18 GÍN

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11. KÙ.BABBAR-*áp-šu-nu* 2 *ma-na* LÁ 6 GÍN
12. 5 GÍN *a-mu-tám sà-ḫa-ar-tám*
13. KIŠIB *ku-nu-ki-a I-pì-li-ší*(?) *ub-lá-ku-nu-tí*
14. *um-ma a-na-ku-ma a-ni-kà-sí-a*
15. *id-a-ší . šu-ma ta-dí-na-a-ší*
16. *té-er-ta-ku-nu . li-li-kám*
17. *šu-ma a-mu-tí . i-ba-ší . šé-bi$_4$-lá-nim*
18. *i-na ṭup-pì-ku-nu wa-ar-ki-im*
19. *um-ma a-tù-nu-ma . ku-ta-nam*
20. *a-ra-áb-e-tí-kà . ni-dí-in*
21. *ra-áb-e-tí-a . kà-ru-um e-nu-na*[*m*]*-ma*
22. *ší-im-šu . i-ni-kà-sí*
23. *ta-ša-kà-na* 13 *ku-ta-ni*
24. *a-na* 4 ⅔ *ma-na* 6(!) GÍN
25. *ta-dí-na* ŠÀ 1 *ma-na* 1 ¼ GÍN
26. *a-pá-zu-ur-tí . ki-li* TÚG.ḪI.A
27. *ta-dí-na ší-tí* KÙ.BABBAR 3 ⅔ *ma-na* (eras.) 5 LÁ ¼ GÍN
28. 8 TÚG.ḪI.A *ša li-wi-tim*
29. *a-na* 2 *ma-na . ta-dí-na* (2 signs erased)
30. *ší-tí* TÚG *ku-ta-ni-a* 21 (eras.) *mì-ma*
31. *lá tù-ba-la*(!)*-nim a-ma-kám*
32. *dí-na-šu-nu-ma lu a-ni-kà-sí-a*
33. *lu a-šar . ta-da-nim dí-na-šu-nu-ma*
34. *a-ša ni-kà-sí-a* . KÙ-*áp-ku-nu*
35. *le-qí-a* ⅔ *ma-na* KÙ
36. *qá-tí* Šu-^{d}*En-líl i-dì-ú*
37. *ù um-ma šu-ut-ma a-na E-na-ba-ša-*⌜*at*⌝
38. *šu-pu-ur-ma* KÙ-*pì lu-šé-bi$_4$-lam*
39. *mì-šu-um lá-qá-am lá i-mu-a*
40. *ma* KÙ-*pì i-ba-ší iš-tù* 5 ITI.KAM
41. 3 *ma-na*.TA *ú-lá* 4 *ma-na*.TA
42. ⌜TÚG⌝ 10 *qá-tám i-dí-ú i-a-ti*
43. *ma-ti-ma ú-la ta-áš-pu-ra-nim*
44. *a-ba-ú-a a-tù-nu qá-tí ma-lá*(!)
45. *ta-dí-a-ni šu-up-ra-nim-ma lu-šé-bi$_4$-lá-ku-nu-tí*
46. *gi-im-lá-ni ù šu-ma lá ta-ga-mì-lá-ni ki-ma a-ḫu*
47. *a-na a-ḫi-im ṣí-ib-tám i-du-nu i-ṣí-ri-a le-qí-a*
48. *ni-kà-sú li-šé-ṣí-ú-ma ṭup-pì-a sí-in-qá-ma*
49. *za-ku-tám šu-up-ra-nim ṣí-ib-*<*tám*> *i-ṣí-ri-a lá ta-lá-qí-a-ma*
50. *a-ṣí-ir lu-mu-un li-bi$_4$-a lu-mu-un li-bi$_4$-im lá tù-sà-ba-nim*

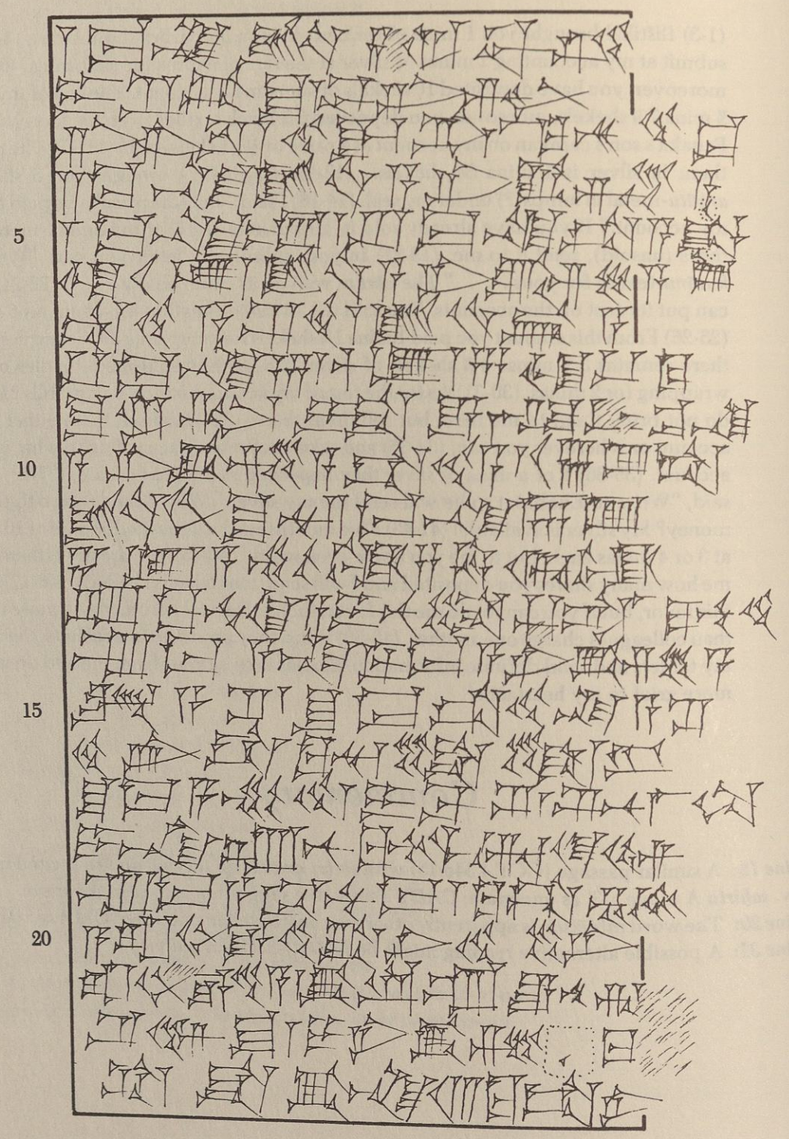
Translation

(1-3) Ilištikal brought you 1 mina of refined silver in his earlier shipment so (4-5) I will submit at my accounting 2 minas of silver at the rate of ⅔ mina for each mina, (6-11) and moreover, you have deposited 10 shekels of silver in my account. The rest of my silver is ⅓ mina 7 ½ shekels; moreover, you deposited 6 ½ black textiles from the merchandise of Panaka's son's caravan on my account at a price of 18 shekels each. (11-12) The price for them in silver is 1 mina 54 shekels. (12-13) I-pì-li-ší(?) brought you 5 shekels of *amūtu*-metal in lumps(?) under my seal. (14-16) I said, "Put (the price to be paid for it) on my account." If you have already sold it, let me know. (17) If my *amūtu*-metal is still there (unsold), send it to me. (18-21) In your subsequent letter you said, "We gave a *kutānu*-textile for your . . . ." The *kārum* waived its claim on my . . . , (22-24) so you can put its cost on the accounts. You sold the 13 *kutānu*-textiles for 4 ⅔ minas 6 shekels. (25-26) From this amount you paid 1 mina 1 ¼ shekels for smuggling all the textiles, (27) so there remains 3 ⅔ minas 4 ¾ shekels of silver. (28-29) You sold the 8 textiles used for wrapping for 2 minas. (30-31) As for the rest of my *kutānu*-textiles, being (still) 21 pieces, do not bring them to me here, but sell them there, (32-33) so sell them either for my account or wherever you can, (34-35) and take your money according to what is on my account. (35-36) ⅔ of a mina of silver they deposited as Šu-Enlil's share, (37-40) and he said, "Write to Enabašat so he will send me my silver." Why did he refuse to take the money? My silver is available! (41-43) Five months ago he deposited a share of 10 textiles at 3 or 4 minas each, but to me you never even wrote! (44-45) You are my fathers! Write me how many shares you deposited and I will send you (what is needed). (46-47) Do me this favor, but if you cannot do me this favor, then at least take from me no more interest than colleagues charge one another. (48-50) When they produce the accounts, then check my tablets and send definite information. Do not take interest from me and do not add more grief to my heartache!

Commentary

Line 12: A similar passage (CCT 4 34c:15) with *sà-ḫa-ar-tám* qualifying *amūtu* is cited in *CAD* s.v. *saḫirtu* A usage a-3′ as uncertain; *CAD's* alternative suggestion is to read *ṣaḫartam*.
Line 20: The word *rab*^{2}*ētum* is apparently otherwise unattested in published Old Assyrian texts.
Line 31: A possible alternative reading might be *tù-šé*(!)*-ba*(!)*-la*(!)*-nim*.

obv.



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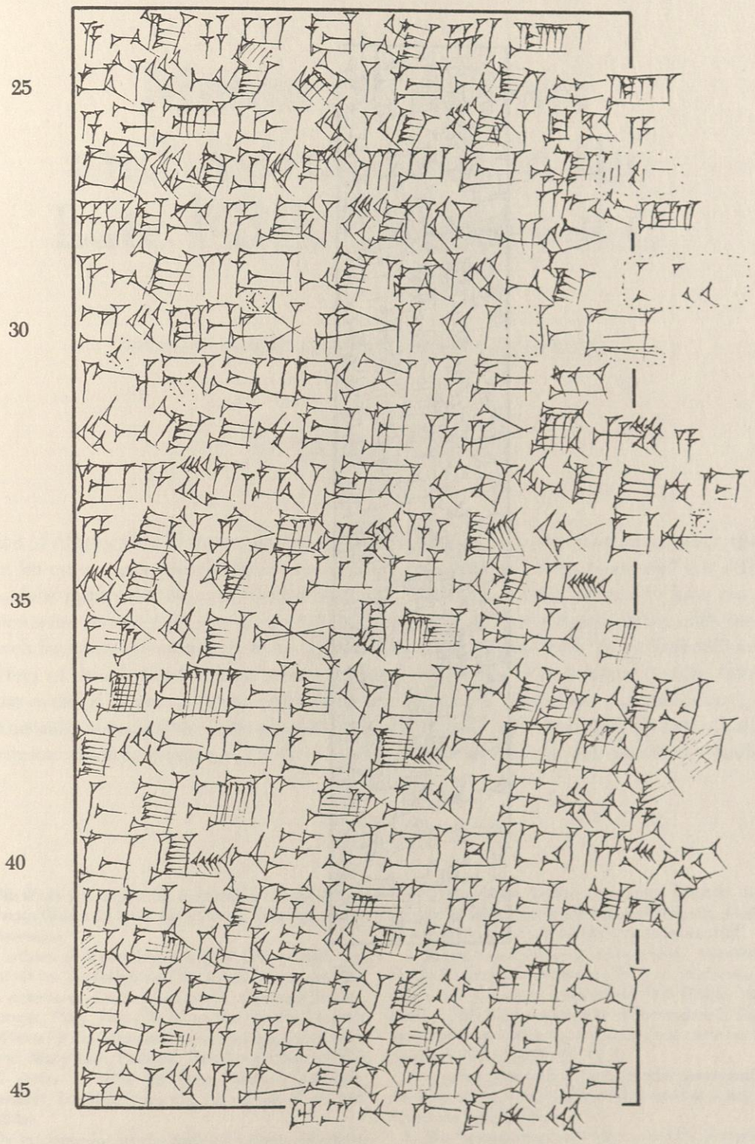

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Meton of Athens and Astronomy in the Late Fifth Century B.C.

ALAN C. BOWEN AND BERNARD R. GOLDSTEIN

1. INTRODUCTION[1]

Meton of Athens (late fifth century B.C.)[2] was renowned in antiquity as an astronomer, though none of his contemporaries singles him out for this reason in the extant literature.[3] It is difficult now to determine what his contribution was. Since we have nothing written by him, our only evidence is the diverse notices of his work found in the ancient literature and, as is usually the case with such fragmentary evidence, its interpretation is controversial. Still, for all their differences in matters of detail, there is a consensus among scholars that Meton introduced in Athens a lunisolar cycle of 19 years (an *enneakaidekaeteris*), a cycle to aid the use of a parapegma;[4] that Meton actually observed the summer solstice on –431 June 27[5] by means of an instrument called a *heliotropion* which he erected on the Pnyx, a hill in Athens; that this device was either a sundial or

1. This study was supported in part by a research grant to Professor Goldstein from the National Endowment for the Humanities.

The authors used the Loeb Classical Library texts and translations for the following Greek and Roman sources: Aratus, Athenaeus, Cicero, Columella, Diodorus Siculus, Hippocrates, Pliny, Plutarch, Vitruvius; and the Teubner series of texts for the following sources: Aelian, Censorinus, Germinus, Macrobius, Ptolemy, Theo Smyrnaeus; and the Oxford series of texts for these sources: Aristotle, Aristophanes, Diogenes Laertius, Herodotus, Plato, and Thucydides.

2. The evidence for precise dating is scanty: all we have are reports of Meton's observation in –431 [see §5.1] and gossip purporting to relate either how he saved his son from going on the Sicilian Expedition (–414 to –412) or how he avoided going himself: see Plutarch, *Alcibiades* 17.4-5 and *Nicias* 3.5-6; Aelian, *Varia historia* 10.7.

3. Meton is mentioned in Aristophanes, *Aves* 992-1020 and in Phrynicus, *Monotropos* Fr. 3 (A. Meinecke [ed.], *Fragmenta comicorum Graecorum* 2.1 [Berlin: Reimer, 1889], p. 589), both produced in –413: compare P. Tannery, *Recherches sur l' histoire de l'astronomie ancienne* [Paris: Gauthier-Villars, 1893], pp. 12-13.

4. A parapegma is an almanac in which were indicated the dates of star risings and settings as well as solstices and equinoxes [see §3 below].

5. For the notational convention, see O.E. Neugebauer, *A History of Ancient Mathematical Astronomy* (=*HAMA*) (New York: Springer-Verlag, 1975), pp. 1061-62.

a pointer used to mark the noonday shadow; and, finally, that Meton was aware of the inequality of the seasons, that is, of the solar anomaly, though some have doubted that he actually observed the equinoxes.[6] This consensus regarding Meton's contribution belongs to a general interpretive view which supposes that precise observation is crucial to the development of early Greek astronomical theory; that astronomers at that time not only observed the correlations of meteorological events and periodic celestial phenomena, but also used instruments to determine the mean synodic month, the solar year, and the length of the seasons.[7]

In our view, however, this general picture is mistaken insofar as it retrojects uncritically the relatively modern thesis that observation and measurement are the foundation of theory. If one does not count observations of comets [see §3.1], there are only two reports of dated astronomical observations by any Greek before Alexander the Great. The first is Thales' 'prediction' of a solar eclipse in -584,[8] a report which we discount,[9] and Meton's observation of the summer solstice.[10] The next dated observation of a summer solstice is by Aristarchus of Samos in -279.[11] So it is essential to understand properly what the reports of Meton's accomplishment entail, and to do this we think it necessary to bear in mind the character of astronomy from the eighth century B.C. to the time of Plato. Now, as we have argued elsewhere,[12] astronomy—as the name implies—began with the grouping of fixed stars into constellations;[13] and it advanced in this period to the construction of parapegmata correlating the risings and settings of these groupings

6. For this consensus, see, e.g., T.L. Heath, *Aristarchus of Samos* (Oxford: Clarendon Press, 1913); W. Kubitschek, "Meton," in A. Pauly, G. Wissowa, *et. al.* (eds.) *Paulys Real-Encyclopädie der classischen Altertumswissenschaft* (=*RE*) (Stuttgart, 1894-) 15.2 cols. 1458-1466; D.R. Dicks, *Early Greek Astronomy to Aristotle* (Ithaca, NY: Cornell University Press, 1970), pp. 87-88; G.J. Toomer, "Meton," in C.C. Gillespie, *Dictionary of Scientific Biography* (=*DSB*) (New York: Charles Scribner, 1970-1980) 9, pp. 337-40; B.L. van der Waerden, *Archive for History of Exact Sciences* (=*AHES*) 29 (1984) 101-24.

7. Compare A.E. Samuel, *Greek and Roman Chronology* (Munich: C.H. Beck, 1972), pp. 19, 23-28, 40.

8. Herodotus, 1.74.1-3; Pliny, *Historia naturalis* 2.53; Cicero, *De div.* 1.112.

9. See A. Aaboe, *Journal for History of Astronomy* (=*JHA*) 3 (1972) 105-118; S. Newcomb, *Researches on the Motion of the Moon* (Washington, DC: Government Printing Office, 1878), pp. 28-30.

10. For a list of dated observations in Ptolemy's *Almagest*, see O. Pedersen, *A Survey of the Almagest* (Copenhagen: Odense University Press, 1974), pp. 408-22. There are reports of dated eclipses in the non-technical literature, that is, in texts by non-astronomers written for non-astronomers. These reports are unreliable and difficult to interpret: compare Newcomb, *Researches*, pp. 28-34. Regarding the solar-eclipse observations associated with Helicon of Cyzicus (Plutarch, *Dion* 19.3-5) and Agathocles (Diodorus Siculus 20.5.4-5) on -360 May 12 and -309 August 15, respectively, see Neugebauer, *HAMA*, pp. 316, 665-66, 666 n. 8. For Hipparchus' use of a solar-eclipse observation dated at -189 March 14 rather than at -309 August 15, see Toomer, *AHES* 14 (1974) 126-42. There are, of course, reports of undated observations: see, for example, the fragments concerning Eudoxus' mapping of the celestial sphere in F. Lasserre, *Die Fragmente des Eudoxos von Knidos* (Berlin: de Gruyter, 1966); or B.R. Goldstein, *Archives internationales d'histoire des sciences* 33 (1983) 10-12, on Pytheas' value for the latitude of Marseilles.

11. Ptolemy, *Alm.* 1.206:24-207:7

12. B.R. Goldstein and A.C. Bowen, *Isis* 74 (1983) 330-34.

13. The ending, -νομία, of ἀστρονομία, is related to the noun νόμος and to the verb νέμω. In the usual etymology, the fundamental referent of the terms is taken to be law or order. Thus, E. Laroche (*Revue de philologie* [=*RevPhil*] 20 [1946] 118-23), for example, maintains that in the fifth century, ἀστρονομία, the mathematical science of the laws governing the motions of the heavenly bodies, came to be distinguished from ἀστρολογία, the amorphous Ionian discourse which combined what we regard as cosmogony and cosmology. Laroche's explication of what ἀστρονομία actually was at this time is open to question. To begin, he does not explain how he understands law, order, and regularity—the three are not necessarily the same—or how mathematics was relevant. Nor does he justify his assumption that the celestial regularity in question is limited to motion and does not include the patterns stars may be thought to form. Next, the linguistic and material distinction he draws between astronomy and astrology in the fifth century requires taking as authoritative writers who lived a millennium later, and ignoring the likelihood that their historiography is colored by philosophical and scientific innovations in the fourth and third centuries B.C. as well as by more contemporary concerns. Finally, after he misreads the *Republic* by confusing the parapegma tradition which Plato rejects and what Plato regards as astronomy (Laroche, *RevPhil* 20 [1946] 119-20; compare Plato, *Respublica*, 527d1-528a5, 528e3-530c3; [Plato], *Epinomis*, 990a2-b4; and §5.3), and then reports Aristotle's view, Laroche supposes that, on the strength of his own account of fourth-century usage and of the reports found in later commentaries and doxographies, he can assess the worth of linguistic testimony which derives from the fifth century. For our part, we follow Tannery (*Hist. de l'astron.*, pp. 1-25) in emphasizing that early usage of ἀστρονομία relates το νόμος and νέμω in the sense of assignment or distribution: this fits the linguistic and technical evidence better.

14. H. Hunger and E. Reiner, *Wiener Zeitschrift für die Kunde des Morgenlandes* (=*WZKM*) 67 (1975) 22.

15. *WZKM* 67 (1975) 21-28.

with meteorological phenomena, and of calendar cycles designed to render the parapegmata applicable throughout a number of years. This advance was made, we think, without a system of coordinates, without recourse to a celestial globe, and without precise measurement to determine the risings and settings [see §3.1]. (There was as well a tradition of cosmological astronomy in the philosophical schools; but this need not detain us here, since this cosmological tradition and calendric astronomy are independent of one another during the period under consideration.)

This brief account of astronomy in Meton's time fits uneasily with the usual story of Meton's own achievement. Clearly, either Meton was exceptional in undertaking precise observations or the standard view of what Meton did is wrong, at least in part. We think the latter and propose to reinterpret the testimony about him accordingly, by understanding his work in terms of instruments, techniques, and goals which are more appropriate to his time than is the assumption that precise observation was a *desideratum* in the fifth century. In general, we will argue as a plausible hypothesis that Meton's astronomical contribution may be better understood in the light of Babylonian computational schemes and literary genres, among which the construction of a parapegma played a central role. As part of the contextual evidence, we offer some passages in the medical literature of the fifth century, literature that has not previously been cited in regard to Meton: these passages are important because they indicate reasons why Meton engaged in the astronomical activities he did [see §5.3]. Since the observations needed for constructing a parapegma are extremely rudimentary, one consequence of our reconstruction is that those who think early Greek astronomy is to be characterized by the careful accumulation and examination of observational data must now defend this view by examining critically the evidence actually available from this period.

2. THE METONIC CYCLE

To begin our account of Meton's contribution to early chronology, we define three terms. First, there is the *lunisolar* or *calendric cycle* in which a certain number of years is correlated with a certain number of months and, often, with a certain number of days. Next, there are *observational procedures* (for instance, the *Pleiaden-Schaltregel*: 'If the Moon and Pleiades are in conjunction on the first day of Nisan, this is a normal year; if the Moon and Pleiades are in conjunction on the third day of Nisan, this is a leap year')[14] which enable one to decide whether a given lunar year is intercalary. And finally, there are *intercalary schemes* which consist of arithmetical rules for intercalating months throughout a calendric cycle. Such precision is necessary, since these *definienda* are not always associated in the historical records. Thus Oenopides' calendric cycle, which correlates 59 years and 730 synodic months [see §2.1], is found independent of any observational decision-procedure or scheme for intercalation. Moreover, such decision-procedures as the *Pleiaden-Schaltregel* and the others described by Hunger and Reiner[15] are not stated in connection with any calendric cycle.

Now each calendric cycle posits a fundamental relation. In the cycle attributed to Meton, this relation may be defined by the equation,

$$19^{y} = 19 \cdot 12^{m} + 7^{m} = 6940^{d}$$

The first part of this equation, the correlation of 19 solar years and 235 synodic months, is known from early Babylonian documents and in later times it served to regulate the Babylonian civil calendar. Some maintain that the Babylonians first realized in the eighth century that there are almost exactly the same number of days in 235 synodic months as in 19 solar years, though they took several centuries to accumulate the data to establish a rule for making the 7 intercalations.[16] But it is sufficient for our purposes that the 19-year calendric scheme complete with rules for intercalations is attested in the very early part of the fifth century.[17] Though it is possible that Meton did discover the fundamental relation of 19 years and 235 months independently, it is far more likely that he learned of it from the Babylonians.[18] In any event, that he did indeed know this relation is fairly certain, given the ancient testimony, some of which derives from the fourth century B.C. [see §6.1].

It will be useful to elaborate a line of argument which has not yet been appreciated sufficiently,[19] by showing how the cycle, $19^{y} = 235^{m}$, can be constructed without a series of precise observations. Now the immediate purpose of this cycle is to identify an integral number of solar years corresponding to an integral number of synodic months. This can be accomplished given that

(1) the solar year is slightly longer than 365 days;
(2) a lunation takes either 29 or 30 days;[20] and
(3) the length of 12 synodic months (a lunar year) is a little more than 354 days or, equivalently, there are more 30-day months (full months) than 29-day months (hollow months) in the cycle.

Now (1) and (3) yield that

(4) the *epact* (or difference between a solar and a lunar year) is roughly 11 days.

Thus, to find a cycle of years which contains an integral number of synodic months, it suffices to determine p and q, where p is the number of years and q the number of months accumulated by virtue of the *epact*, such that

(5) $29\frac{1}{2} \cdot q < 11 \cdot p < 30 \cdot q$.

16. R.A. Parker and W.H. Dubberstein, *Babylonian Chronology 626 B.C. to A.D. 75* (Providence, RI: Brown University Press, 1956), pp. 1-3.

17. See Neugebauer, *HAMA*, pp. 354-55, and §5.1. The anomalous intercalation of a second Addaru (XII_2) in -383/2, that is, in year 20 of the reign of Artaxerxes II, is now generally regarded as without astronomical importance. Moreover, in private correspondence Professor Asger Aaboe has stated that there is evidence in cuneiform tablets suggesting that the intercalation did not occur in -383/2 but in -382/1 as one would expect. Thus, the introduction of the 19-year cycle with intercalation rules may date as far back as the cycle beginning in -497/6, which is much earlier than the fourth-century dating (ca. 380 B.C.) proposed by A.J. Sachs (*Journal of Cuneiform Studies* [=*JCS*] 6 [1952] 105-114), Samuel (*Greek and Roman Chronology*, p. 21), and E.J. Bickerman (*Chronology of the Ancient World* [2nd ed.; Ithaca, NY: Cornell University Press, 1980], p. 24), for example.

18. See Neugebauer, *HAMA*, pp. 622-23; as well as §§5.1 and 6.1.

19. Goldstein, *Isis* 57 (1966) 115-16; compare A. Aaboe and D.J. de Solla Price, "Qualitative Measurement in Antiquity," in *Mélanges Alexandre Koyré* (Paris: Herman, 1964) 2, pp. 1-20.

20. A lunation is the interval of time from the first visibility of the new crescent near the western horizon after sunset, that is, from new moon or the first appearance of the moon after its period of invisibility when it is in conjunction with the sun, to the next occurrence of the same phenomenon. Since this interval extends roughly from one sunset to another, it is therefore treated as an integral number of days.

The least integral solutions of this inequality are

$p = 19$ and $q = 7$,

values which the early Greeks could find quite easily.[21]

Clearly, to identify a period of 19 solar years with 235 synodic months (of which 7 are intercalary) one need not determine in advance the precise length of the year or of the mean synodic month: the data of common lore are sufficient. Thus, (1) may be found, for example, by counting the days between consecutive heliacal risings of some bright star, or by counting the number of days it takes the sun to return to the same point on the horizon from the same direction. And (2) is a fact of the lunar calendar.

The cycle Meton established, however, goes further than the basic relation found in Babylonian texts.[22] As Censorinus[23] reports, Meton also posited that there were 6940 days in the 19-year cycle;[24] and Geminus,[25] who mentions Euctemon but not Meton in connection with this cycle,[26] claims that 110 of these months were hollow and 125 were full.

How these months were distributed is unknown: Geminus' account (which defines a sequence of full and hollow months for the entire 19-year interval but is not explicit about how these months are to be grouped into years) is obviously a reconstruction and a poor one at that.[27] Toomer[28] denies that there is any evidence of Meton's rules for intercalating months or for arranging the sequence of full and hollow months. And so it would follow that one cannot ignore the possibility that Meton, like his contemporary, Oenopides, presented a calendric cycle which was not supplemented with either an intercalary scheme or observational decision-procedures.

It is important to notice that the Metonic cycle differs from the Babylonian version by specifying the total number of days or, equivalently, the number of full and hollow months. As Neugebauer[29] suggests, this difference may be a result of the Babylonian reliance on the synodic month as the basic unit of time and of Meton's desire to accommodate the cycle to a calendar year of 365 days and the parapegma [see §3].

2.1 THE NUMBER OF DAYS

We accept the claim that Meton posited that there were 6940 days in his calendric cycle and that there were 125 full months and 110 hollow months. Consider Table 1:

21. Compare D.H. Fowler, *The Mathematics of Plato's Academy* (Oxford: Clarendon Press, 1987), for discussion of ἀνθυφαίρεσις (reciprocal subtraction), a technique for solving such problems which may figure in pre-Eudoxan ratio theory.

22. Compare Neugebauer, *HAMA*, pp. 354-57.

23. *De die natali* 18.8.

24. Compare Hipparchus in Ptolemy, *Alm.* 1.207.7-10 with G.J. Toomer, *Ptolemy's Almagest* (New York: Springer-Verlag, 1984), p. 137 n. 19.

25. *Introductio astronomiae* 8.50-56.

26. C. Manitius, the editor of Geminus, *Intro. ast.*, suggests that Meton's name has been omitted accidentally from the text (*Gemini elementa astronomiae* [Leipzig: Teubner, 1898], pp. 268-69). Meton and Euctemon were contemporary and are not clearly distinguished in the surviving ancient texts (see A. Rehm, "Parapegma," *RE* 18.4 col. 1340; and Neugebauer, *HAMA*, p. 623 and n. 12).

27. See Neugebauer, *HAMA*, p. 617; compare Heath, *Aristarchus*, p. 294 n. 1; and §5.1 below. But van der Waerden (*AHES* 29 [1984] 103) contends implausibly that the removal of every 64th day is a problem only for a civil calendar and not for an astronomical calendar (such as he thinks Meton and Euctemon were using). Van der Waerden, *Journal of Hellenic Studies* (=*JHS*) 80 (1960) 168-80; *AHES* 29 [1984] 112-13) conjectures that in each 19-year cycle years 2, 5, 8, 10, 13, 16, and 18 were intercalary. Presumably, one is to assume initially that all months were of 30 days and then to omit or pass over every 64th day; compare Samuel, *Greek and Roman Chronology*, pp. 46-47.

28. G.J. Toomer, "Meton," *DSB* 9, p. 337.

29. *HAMA*, p. 622.

Number of Months		Total Number of Days
Hollow	Full	
117	118	6933
116	119	6934
115	120	6935
114	121	6936
113	122	6937
112	123	6938
111	124	6939
110	125	6940
109	126	6941

TABLE 1. The *Enneakaidekaeteris*

The first three versions of the 19-year cycle are eliminated by (1), since the total number of days in each is less than or equal to 6935 days ($= 19 \cdot 365^d$). But, obviously, the premise-set is not specific enough to isolate a single version among the rest. One way to tackle this problem is to find a claim somewhat more precise than (1), for example,

(1′) the solar year is roughly 365¼ days in length.

Given that $19 \cdot 365\frac{1}{4}^d = 6939\frac{3}{4}^d$, the question then becomes whether to round upwards and posit a cycle length of 6940 days or to ignore the fraction and posit one of 6939 days. Since Meton adopted the former value, one might suppose that he rounded upwards to minimize the discrepancy which accumulates between his cycle and long sequences of 365¼-day years.[30] And so it would follow that the 19-year cycle contains 110 hollow months and 125 full months. For anyone who proposes such a reconstruction, it would remain to show how the year length of 365¼ days was discovered and to determine thereby whether the Metonic cycle is a theoretical edifice founded on precise observations or a computed result guided by crude considerations of phenomena.

In our estimation, however, this way of reconstructing how Meton came to posit a cycle length of 6940 days is misconceived, since it presumes a method of computation which necessitates rounding fractions. We think that the initial approaches to calendric problems were by counting and by the study of inequalities—as is apparent in our preceding derivation of the relation, $19^y = 235^m$, and as we will show in our reconstruction of the calendric cycle ascribed to Oenopides and of the *octaeteris*. More important, the proposed strategy begs an important question bearing on the purpose of the 19-year cycle, for instance, whether it is to regulate an astronomical calendar. (We understand an *astronomical calendar* to be a calendar based on some set of theoretical principles that generally involve the computation of such non-observable events as mean conjunction. We distinguish astronomical calendars from *schematic calendars* which are based

30. Compare Neugebauer, *HAMA*, pp. 622-23.

on simple arithmetic rules for determining the integral number of days in a given month and the integral number of months in a given year. Both astronomical and schematic calendars may be used for civil purposes.)

If the 19-year cycle were intended for this function, then the critical problem in elaborating it with rules or schemes for intercalation would be not so much to specify the beginning of the solar year (i.e., the length of the solar year) as it would be to propound a scheme for arranging the months within each year such that the first day of the year (Hecatombaion 1 in Athens) occurs on or shortly after the first day of the summer season.[31] This first day of summer was apparently defined in a couple of ways during the fifth century, that is, by the heliacal rising of the Pleiades[32] and by the occurrence of summer solstice.[33] Thus, we prefer an analysis which avoids rounding fractions and addresses the question of what the calendric cycle is ultimately for. On the latter point, for reasons which will become apparent, we also prefer a strategy which does not assume that the Metonic lunisolar cycle was to serve in an astronomical calendar.

Before explaining our own hypothesis about how Meton came to think that the 19-year cycle was 6940 days in length, we will first review what we take to be the two major, competing calendric schemes in fifth-century Greece. (The reader should consult A. E. Samuel, *Greek and Roman Chronology* [Munich: C. H. Beck, 1972], pp. 40-42 for a useful but cursory review of other early cycles mentioned in the ancient literature.)

According to the first scheme, there are 365 days in a solar year. How this was decided upon by the Greeks is unknown. We know only that it is the standard year length assumed in every Greek parapegma extant. In any event, we cannot simply suppose that this value for the year length is the result of carefully observing the heavens. The counter-example to such an uncritical assumption is found in the history of the Egyptian civil calendar. This calendar is based on the schematic relation,

(6) $1^y = 365^d = 12 \cdot 30^d + 5^d$.

As Neugebauer has shown,[34] this year length is not the result of centuries of observing celestial phenomena: it is really just derived from the *average* period between successive inundations of the Nile; and this computation was made at a time when the flooding of the Nile coincided with the season called inundation (probably ca. 2800 B.C.), using an arithmetical technique which precludes fractional values.

Oenopides of Chios, an early contemporary of Meton, probably took this value for granted in establishing his Great Year, that is, his cycle in which 59 years correspond to 730 months.[35] His reasoning was most likely as follows:[36]

since

(7) $1^y = 365^d$ and

(8) $2^m = 59^d$,

then

(9) the *epact* is 22 days every 2 years.

31. Compare A. Pannekoek, *A History of Astronomy* (London: George Allen and Unwin, 1961), pp. 20-22.

32. See, for example, [Hippocrates], *De natura hominis* 3.68.10-18 with R. Joly, "Hippocrates of Cos," *DSB* 6, pp. 419-20: compare Aristotle, *Meteorologica* 361b32-35; W.K Pritchett and B.L. van der Waerden, *Bulletin de correspondance hellenique* (=*BCH*) 85 (1961) 17-52.

33. Compare Samuel, *Greek and Roman Chronology*, p. 64 and n. 1.

34. *Acta Orientalia* 17 (=*AO*) (1938) 169-95; and *Journal of Near Eastern Studies* (=*JNES*) 1 (1942) 397-403.

35. Theo Smyrnaeus, *Expositio* 198.14-16; Aelian, *Var. hist.* 10.7.

36. Compare K. von Fritz, "Oinopides," *RE* 17.2 cols 2262-64.

But, if there are p years in the cycle and q intercalary months, then in $2 \cdot p$ years

(10) $p \cdot 22 = 59 \cdot q$.

The least integral values satisfying this equation are

$p = 59^{y}$ and $q = 22^{m}$.

Accordingly, Oenopides' Great Year is defined by the relation,

$59^{y} = 59 \cdot 12^{m} + 22^{m} = 730^{m}$.[37]

Again, none of the premises in this derivation of the 59-year cycle requires carefully observing celestial phenomena. We have already discussed (7) and (9). As for (8), all it presupposes is (2) and a modified version of (3):

(3′) the length of the 12 synodic months (the lunar year) is exactly 354 days, that is, there are as many full months as there are hollow months in a lunar year.

In the second calendric scheme, however, the length of the year is 365¼ days, a value which is an implicit result of computation, as we will show. Unlike the Babylonians,[38] the Greeks devised an *octaeteris* or 8-year cycle of 99 months (3 intercalary) or 2922 days.[39] This cycle was known in the fourth century but it was probably devised in the late sixth or early fifth century. The ancients disagree about who is to be given credit for this *octaeteris* as its author,[40] and champion both Cleostratus of Tenedos (ca. late sixth century) and Eudoxus of Cnidos (died ca. -335).[41] We think it more likely that the cycle was introduced before Meton's time: once Meton's cycle was established, the way to accommodate the 365¼-day year would be that of Callippus [see below] and not by introducing a cruder 8-year cycle.[42]

The 8-year lunisolar cycle, which may be defined by the equation,

$8^{y} = 8 \cdot 12^{m} + 3^{m} = 2922^{d}$,

also requires no additional observations. For, if the *epact* in 1 year is roughly 11 days [cf. (4) above], then in 8 years the sun would be about 88 days ahead of the moon. Now, 3 synodic months may consist in 87 days (3 hollow months), 88 days (2 hollow, 1 full), 89 days (1 hollow, 2 full), or 90 days (3 full). Table 2 displays the alternatives.

37. Censorinus (*De die nat.* 19.2) claims that Oinopides posited a year length of $365^{22}/_{59}$ days. Many have attempted to accommodate this claim by supposing that once Oinopides had correlated 59 years and 730 months, he then consulted calendric records (of which we have not the merest shred of evidence) and determined that $730^{m} = 21557^{d}$, a result which yields a year length of $365^{22}/_{59}$ days (see, for example, Heath, *Aristarchus*, pp. 132-33: compare Fritz, "Oinopides," *RE* 17.2 cols. 2262-64). But this seems quite unlikely, especially when it is combined (as in Heath's account) with speculation that Oenopides' Great Year was also intended to cover the periods of Saturn, Jupiter, and Mars: there is no evidence of any concern with planetary motion until the fourth century (see Goldstein and Bowen, *Isis* 74 [1983] 330-40). Moreover, Toomer (as reported in I. Bulmer-Thomas, "Oenopides of Chios," *DSB* 10, p. 180) has shown that Censorinus' value for Oenopides' year length is a later addition reached by making the anachronistic assumption that the length of the month is 29;31,50,8,20 days (that is, by using the Babylonian value for the mean synodic month, a parameter known to Hipparchus in the second century B.C.) rather than 29½ days.

38. Neugebauer, *HAMA*, p. 354; but see Hartner, *JHA* 10 (1979) 3.

39. Geminus, *Intro. ast.* 8.27; Censorinus, *De die nat.* 19.4-5.

40. See Neugebauer, *HAMA*, pp. 620-21.

41. On Eudoxus' dates, see G. de Santillana, *Isis* 32 (1940) 248-62; Lasserre, *Die Fragmente*, pp. 137-39.

42. Compare Samuel, *Greek and Roman Chronology*, pp. 39-40.

The first two values of 87 and 88 days are unacceptable because the versions of the cycle they determine both contravene (3).[43] So this leaves a cycle of 49 hollow and 50 full months and another of 48 hollow and 51 full months. But to choose between them, all one needs is the simplifying assumption,

(11) all intercalary months are 30 days in length.[44]

Accumulated Epact in days	Number of Months Hollow	Full	Total Number of Days
87	51	48	2919
88	50	49	2920
89	49	50	2921
90	48	51	2922

TABLE 2. The *Octaeteris*

Thus, there are 48 hollow months and 51 full months or 2922 days in the 8-year cycle, and, *as a consequence*, this yields a year length of 365¼ days.

When one considers Oenopides' 59-year cycle with its 22 intercalary months and the *octaeteris* with its 3 intercalary months, it becomes apparent that each is less effective as a scheme for arranging the synodic months than Meton's *enneakaidekaeteris*. To see this, compare $|\Delta|$, the absolute value for the difference between the modern value for the mean synodic month (29.53059^{d}) and the value which is implicit in each of these cycles [see Table 3].

Now, it might seem appropriate to ask how an Athenian of the fifth century would reach the same conclusion. Of course, to ask this is to suppose that the Metonic cycle is intended for use in an astronomical calendar, an assumption we think mistaken. Still, if one makes this assumption just for the moment and supposes that the *octaeteris* and Meton's *enneakaidekaeteris* were originally supplied with rules for intercalation,[45] to choose between these cycles would require determining the relative proximity of the consecutive occurrences in each cycle of Hecatombaion 1 to the beginning of summer. Thus, if Meton had been aware of these two competing calendric cycles, and if his goal had been to devise an astronomical calendar, his penultimate purpose in introducing his version of the 19-year cycle might have been to improve the intercalary scheme of

43. There is an 8-year cycle mentioned in [Eudoxus'] *Ars astronomica* cols. 13-14 (F.W. Blass [ed.], *Eudoxi ars astronomica* [Kiel: Schmidt and Klaunig, 1887], p. 20; trans. Tannery, *Hist. de l'astron.*, p. 290) and it seems to have contained 49 full months and 50 hollow months. Neugebauer (*HAMA*, p. 620) holds that this was in fact the earliest version of the *octaeteris*, on the ground that the text refers repeatedly to the 365-day year as a norm:

$8 \cdot 365^{d} = 2920^{d} = 8 \cdot 354^{d} + 2 \cdot 29^{d} + 1 \cdot 30^{d}$
$= 50 \cdot 29^{d} + 49 \cdot 30^{d}$.

There is too little evidence to settle the question of priority. But this does not affect our point here, which concerns only the argumentation underlying the *octaeteris* of 2292 days.

44. Compare Geminus, *Intro. ast.* 8.30-31.

45. So far as we know, no ancient writer has associated Oenopides' 59-year cycle with a scheme for intercalation.

Calendric cycle	$\lvert\Delta\rvert$ in days*
Oenopides: 59-year	0.030590
octaeteris	0.015438
Meton: 19-year	0.001325

TABLE 3. Comparison of Fifth-Century Calendric Cycles
*$|\Delta|$ is the absolute value in days of the difference between the modern value for the mean synodic month (29.53059 days) and that implicit in the respective cycles.

the *octaeteris* by keeping the occurrence of Hecatombaion 1 on or after and nearer the first day of summer as defined by summer solstice. Such an answer may seem overly qualified for some; but it is useful for our purposes because it introduces a new question, How could Meton know when the solstices were to occur?, and this question introduces the first stage in our demonstration that Meton's *enneakaidekaeteris* was not meant to be part of an astronomical calendar but had a much more limited use.

The usual response to this question is: By observation—How else? And so follows the assumption which is basic to what we have described as the 'usual story' or 'consensus' about Meton. Our answer to this question and to the problem of how Meton arrived at the value of 6940 days for the length of his cycle is different. We admit that it is conjectural, but hasten to add that in this respect at least it differs not at all from what has hitherto been written on the subject. At the same time, we also point out that if our account is plausible, it has the consequence that scholars should no longer take it for granted that fifth-century Greek astronomy had set itself the goal of accumulating and analyzing observational data.

We propose that Meton learned more than just the relation, $19^{y} = 235^{m}$, from the Babylonians, and that he got this information in a report that included numerical data organized according to an earlier version of what is now called the Uruk scheme (after the location where tablets inscribed with such data were first discovered in modern times).

The Uruk scheme is purely arithmetical. As it appears in Babylonian diaries and almanacs,[46] this system when fully expounded is a matrix of dates in the Babylonian calendar over periods of 19 years for the following phenomena: the summer and winter solstices, the vernal and autumnal equinoxes, the heliacal risings (Γ) and settings (Ω) of Sirius, and the (apparent) acronychal risings (Θ) of Sirius. Figure 1 shows the rules governing these dates in each year of the cycle.

Now there are three remarkable features of this scheme. First, given that the same phenomenon occurs 11 tithis later (modulo 30) in consecutive years, it is possible from any one date to compute all the others. Therefore, none can be said to be an observational datum: the entire matrix of dates is a product of clever computation the purpose of which is to keep the

46. See Sachs, *JCS* 2 (1948) 271-90; Neugebauer, *HAMA*, pp. 363-65.

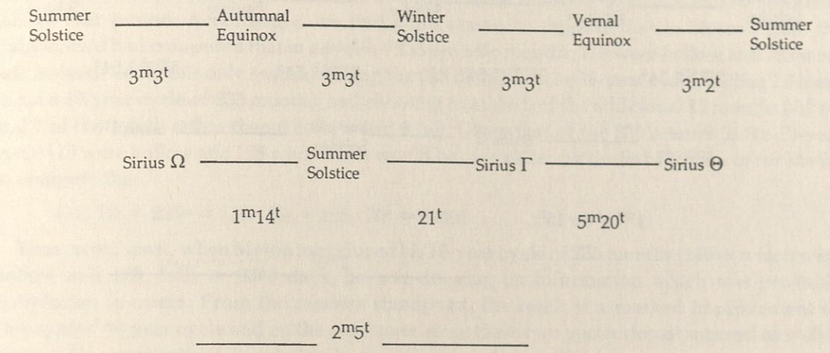


FIGURE 1. The Uruk-Solstice Scheme
1^{t} (a tithi, to use the Sanskrit term) is 1/30th of a mean synodic month: for most practical purposes, 1 tithi can be considered the same as 1 day.

heliacal rising of Sirius in month IV (Duzu)—only in year 11 of any cycle does this rising occur in month III (Simanu). Next, the intercalation pattern is the same as that attested for the 19-year cycle. And finally, though the Uruk scheme gives dates only by year number (Seleucid Era), month number, and an integral number of tithis, it is in fact predicated ultimately on a year length of 12 months and 11;3,10 tithis (= 12;22,6,20^{m}), a value which is also characteristic of the 19-year cycle (that is, 235/19 ≈ 12;22,6,20^{m}). Accordingly, we can say that the Uruk scheme defines the 19-year cycle.[47]

We are aware that the material evidence for this scheme published thus far derives primarily from the close of the fourth century and later, though there are hints of it in tablets from the late fifth century. Sachs[48] and Neugebauer[49] are inclined to assign the invention of the Uruk scheme to the period just before 380 B.C. Still, given new evidence confirming that the 19-year cycle was in use in Babylon a century before this date [see n. 17], the hypothesis that the report to Meton conveyed information from the Uruk scheme is not out of the question. For our purposes, however, it is important to notice that there were earlier schemes of the Uruk type. There is, for example, a text [BM 36731], presented and discussed by Neugebauer and Sachs,[50] which concerns the years -615/4 to -587/6 and may also date from this period. This text, though fragmentary, suggests the following scheme based on a 15-year cycle:

47. Compare Neugebauer, *HAMA*, pp. 357-65.
48. *JCS* 6 (1952) 105-14.
49. *HAMA*, pp. 358, 362-65.
50. *JCS* 21 (1967) 183-90.

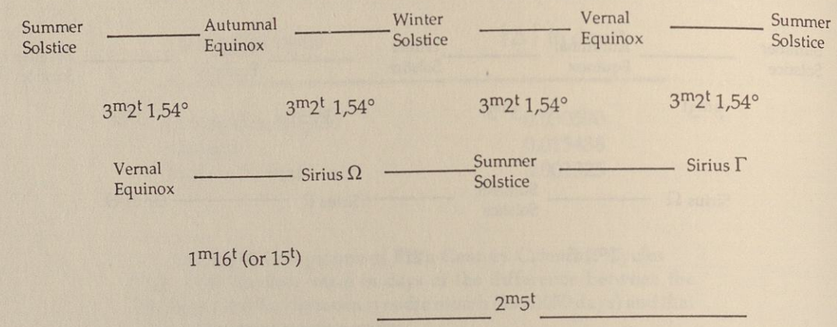


FIGURE 2. The Solstice Scheme of BM 36731
Fractions of a tithi are in time-degrees: $1^t = 6{,}0°$ (360°). In each column the difference is $12^m\ 11^t\ 1{,}36°$, i.e., $12^m\ 11;16^t$.

In sum, we have evidence that the Babylonians were using the 19-year lunisolar cycle at the beginning of the fifth century, and that the Uruk scheme (which derives from the early fourth century) standardizes the solution to a problem for which we have a somewhat different answer dating from the early sixth century. Moreover, there is a striking coincidence in the datings of the summer solstices according to the two schemes mentioned above: if one uses the Uruk scheme for the years -450 to -431 and converts these dates to the Julian calendar using the tables of Parker and Dubberstein,[51] one finds that the summer solstice takes place 13 times on June 28, 4 times on June 29, and once on June 27; whereas in BM 36731, this solstice occurs on June 28 or June 29 (rarely June 27). Accordingly, there is no compelling reason not to conjecture that Meton learned of the 19-year cycle, that is, of the relation $19^y = 235^m$, from a report of a Babylonian scheme which also defined the date of the solstices in each year of the cycle. (We will return to this in §5.1.)

The question now is whether this report included information about the total number of days in the cycle. That it did (at least implicitly) we think plausible. To begin, there is a cuneiform text concerning the moon[52] with an eclipse cycle of 18 years or 223 months (the Saros) of which 105 are hollow and 118 are full. Although this text dates from the Seleucid Era, it is important to remember that the 18-year cycle was probably well known by the middle of the fifth century.[53] Moreover, there is a pre-Seleucid text[54] which mentions the return in longitude of lunar eclipses after 19 years:[55] if one consults Oppolzer's tables,[56] it is readily apparent that, while lunar eclipses of the same character recur in an 18-year cycle, there is a return in longitude of lunar eclipses (not

51. See n. 16 above.
52. *ACT* No. 210 = Neugebauer, *Astronomical Cuneiform Texts*, (London: Lund Humphries, 1955), p. 272.
53. Compare J.P. Britton, "The Structure and Parameters of Column Φ," in J.L. Berggren and B.R. Goldstein, *From Ancient Omens to Statistical Mechanics* (Copenhagen: University Library, 1987), pp. 23-36.
54. Neugebauer and Sachs, *JCS* 21 (1967) 200-207.
55. Compare K.P. Moesgaard, *Centaurus* 24 (1980) 51-96.
56. *Canon der Finsternisse* (Vienna: Kaiserlich-königlichen Hof- und Staatsdruckerei, 1887).

necessarily the same in character) after 19 years. Now this pre-Seleucid text, BM 41004, also makes some rather cryptic remarks about determining the number of full and hollow months in this 19-year period. Accordingly, we find good reason to suppose that in Meton's time the Babylonians had computed that in a cycle of 235 synodic months, 110 were hollow and 125 were full. Indeed, doing this only requires taking the 223 months of the 18-year cycle, adding 12 more to get a 19-year cycle of 235 months; and choosing to make 5 of the additional 12 months hollow and 7 of them full, rather than 6 hollow and 6 full. Given that of the 235 months in the 19-year cycle 110 were hollow and 125 were full, it would be easy either for the Babylonians or for Meton to compute that

(12) $19^y = 235^m = 110 \cdot 29^d + 125 \cdot 30^d = 6940^d$.

Thus, as we see it, when Meton introduced his 19-year cycle of 235 months (110 of which were hollow and 125, full) or 6940 days, he was drawing on information which was probably Babylonian in origin. From the modern standpoint, the result is a marked improvement on Oenopides' 59-year cycle and on the *octaeteris*, since these two cycles do not succeed as well in placing Hecatombaion 1 in relation to the summer solstice. (We leave aside the question of whether Meton actually knew of these cycles or whether he was working independently: we cannot rule out the possibility that, if these cycles were intended to be astronomical, their failures were already well known.[57]) In any event, Meton's innovation was not the result of precise observations undertaken by him or by his Greek predecessors: as we have argued, it may well be dependent on Babylonian numerical data organized according to some predecessor of the Uruk scheme.

From our reconstruction it should be apparent that, in specifying an integral number of solar years which contains an integral number of synodic months and an integral number of days,[58] it was not Meton's purpose to determine the mean lengths of the solar year and the synodic month or to confirm values for these quantities. Such mean values, although arithmetically equivalent to the statement that so many years contain so many months and so many days, are not the same historically: the determination of such parameters is only appropriate to later periods of astronomy when there is a concern with theoretical entities such as mean bodies and a need 'to construct tables of mean motions and equations.'[59] In other words, one must be very careful in attributing to early astronomers the mathematical consequences of what they affirm.

Moreover, it follows that Callippus' revision of Meton's 19-year cycle neither introduces nor requires new information, a conclusion contrary to what one reads in most accounts of Callippus' work.[60] In removing 1 day from a period of 4 Metonic cycles, all Callippus did was to adapt the Metonic cycle to a year length of 365¼ days, a value which, as we have indicated, was probably computed and not the result of observing the heavens closely. The Callippic cycle is defined by the equation,

$$76^y = 4 \cdot 19^y = 4 \cdot 6940^d - 1^d = 27759^d.$$[61]

57. Compare Pannekoek, *HistAst*, p. 25.
58. Compare Geminus, *Intro. ast.* 8.6-10.
59. Neugebauer, *HAMA*, pp. 615-16.
60. See, for example, J.S. Kieffer, "Callippus," *DSB* 3, pp. 21-22.
61. Geminus, *Intro. ast.* 8.57-60; Ptolemy, *Alm.* 1.206:22-207:12.

3. THE METONIC PARAPEGMA

One important purpose of the early Greek calendric cycles was to facilitate the use of almanacs or parapegmata. These cycles were used to correlate dates in the parapegma with dates in a lunar calendar.[62] That is, by means of these cycles, the Greeks were able to coordinate dates in the parapegma with those in their various civil calendars, calendars which though lunar were subject to intercalation for astronomical and for non-astronomical reasons.

The earliest evidence we have of parapegmata dates from the fifth century B.C. Originally, the parapegma was an inscription in stone or wood which correlated in a list the risings and settings of certain fixed stars throughout the (solar) year, and prognostications (ἐπισημασίαι) about the weather. Meton's parapegma is also said by many nowadays to have included the dates of these events in the lunar calendar, but we think this unlikely for reasons which will become clear in due course. If the dates in a lunar calendar were included, since this calendar requires intercalations, care would be needed to correlate the risings and settings throughout the solar year with the days of the appropriate month. And so, either for this reason or simply in order to assist the use of the parapegma on a daily basis, the succession of days was indicated by a peg inserted into (πήγνυμι) holes bored beside (παρά) and between the lines of text.[63] Later one finds a literary type of parapegma: here the sequence of holes for the peg is replaced by remarks on the daily progress of the sun through the signs of the zodiac.[64] Thus, for example, we have

> In day 16 [of the sun's passage through Sagittarius]: according to Democritus, Aquilla rises with the sun; it usually signifies for the most part thunder and lightning, and rain or wind or both. According to Eudoxus, Sirius rises acronychally [i.e., at sunset]—rainy weather. According to Callippus, Gemini sets in the middle [of the night]—southerly winds.[65]

The evidence suggests that Meton and Euctemon were probably the first to devise a parapegma, though Jacoby[66] doubts that Meton actually 'put up in public a model, or a schedule, or a meteorological calendar constructed on the basis of the Enneakaidekaeteris—in short, another anathema.' There are, of course, many questions one should like to ask about this

62. Some have suggested that Meton's *enneakaidekaeteris* was intended to reform the Athenian civil calendar, but this is rejected by Neugebauer (*HAMA*, pp. 616, 622-23) and Toomer ("Meton," *DSB* 9, p. 338) for the good reason that there is no evidence that such cycles were developed to improve the civil calendar; compare Tannery *Hist. de l'astron.*, p. 12.

63. See Rehm, "Parapegma," *RE* 18.4 cols. 1296-1297; Heath, *Aristarchus*, p. 295 n. 1; Pritchett and van der Waerden, *BCH* 85 (1961) 39-40.

64. See [Geminus] *Calendarium*, a text which probably derives from the third century B.C.; compare Neugebauer, *HAMA*, pp. 579-81.

65. [Geminus] *Cal.* 229.9-13.

66. *Die Fragmente der griechischen Historiker* (=*FrGH*), Part III.B, Supplement (Leiden: Brill, 1964-1969) 1, pp. 496-98.

parapegma.[67] In particular, were dates given in the Athenian civil calendar,[68] a calendar which was lunar,[69] or did they belong to an 'artificial' or non-civil calendar? If the latter is correct, what was this calendar? We agree with Neugebauer that it was not the sort of schematic calendar implied in Geminus' suggestion concerning Meton's rule for intercalating 7 months into his 19-year cycle [see §2 and §5.1]. There are three main alternatives: either it was

(a) the Egyptian (schematic civil) calendar of 365 days;[70] or
(b) a lunar calendar which differed from the Athenian civil calendar (which was erratic in the fifth century[71]) and yet borrowed Athenian names for the months;[72] or
(c) a solar calendar of 365 days divided into 12 zodiacal months (a zodiacal month is the duration measured in days of the sun's passage through a zodiacal sign, that is, through 1/12th of the ecliptic).

In any case, it is reasonable to suppose that there was a system for converting the dates in the parapegma to Athenian civil dates throughout a 19-year period.[73]

Unfortunately, there are too few citations of entries from Meton's parapegma in later texts to answer these questions with any certainty. We do have more, however, from a parapegma which is associated with Meton's contemporary, Euctemon. Now Euctemon's parapegma may not have differed significantly from Meton's [see n. 26], and if we accept Rehm's reconstruction,[74] Euctemon would seem to have used a scheme of zodiacal months for dating stellar horizon-phenomena and may even have supplied rules for correlating zodiacal dates and dates in the Athenian civil calendar.[75]

67. Aelian, *Var. hist.* 10.7 states that Meton erected stelae and marked on them the 'turnings of the Sun.' Pritchett and van der Waerden (*BCH* 85 [1961] 40) suppose that these stelae constituted the first parapegma (if they were also inscribed with weather-indications), and identify them with the tables (πίνακες) ascribed to the followers of Meton in the scholium to Aratus, *Phaenomena* 752 (E. Maass, *Commentariorum in Aratum reliquiae* [Berlin: Weidmann, 1898] 478.9-13), though Jacoby (*FrGH* III.B 1, pp. 496-98) supposes that we should distinguish Meton from his followers, that Meton did not erect a parapegma for public use, and (*FrGH* III.B 2, p.403) that Aelian has confused Meton's *heliotropion* and his parapegma (or his 19-year cycle). Van der Waerden (*AHES* 29 [1984] 103) remarks that we do not know whether Meton's stelae were marked with holes or whether this was Euctemon's innovation (compare Rehm, "Parapegma," *RE* 18.4 cols. 1298-99). Tannery, *Hist. de l'astron.* (p. 13 n. 4) takes Aelian to be writing about a sundial marked in relation to the solstice Meton observed. Meton and Euctemon are the earliest parapegmatists mentioned in the extant literature: see, for example, Ptolemy, *Phaseis* 66.24-67.21; [Geminus] *Cal.* 362; Vitruvius, *De architectura* 9.6.3. Diodorus Siculus (12.36.3) connects Meton with a parapegma organized according to the 19-year cycle, but the passage is peculiar in that the occurrence of τὰ ἄστρα is inappropriate; compare Bickerman, *Chronology*, p. 29. See Neugebauer, *HAMA*, p. 588.

68. So Neugebauer, *HAMA*, pp. 617-18, p. 617 n. 10a: compare Columella, *De re rustica* 9.14.12; Censorius, *De die nat.* 13.1-2, 8.

69. Compare Pritchett and van der Waerden, *BCH* 85 (1961) 19-28, 40.

70. Compare Neugebauer, *HAMA*, p. 617.

71. Compare Bickerman, *Chronology*, pp. 35-38.

72. So Toomer, "Meton," *DSB* 9, pp. 337-38; Bickerman, *Chronology*, pp. 37, 101 n. 35; van der Waerden, *AHES* 29 (1984) 123-24.

73. Compare scholium in Aratus, *Phaen.* 752 (Maass, *Commentariorum*, 478.9-13).

74. *Sitzungsberichte der Heidelberger Akademie der Wissenschaften* (=*SitzHeidAkadWiss*) Philolog.-hist. Klasse 4.3 (1913): compare Pritchett and van der Waerden, *BCH* 85 (1961) 31-37, which is revised in van der Waerden, *AHES* 29 (1984) 103-106.

75. Van der Waerden, *AHES* 29 (1984) 108. According to Pritchett and van der Waerden (*BCH* 85 [1961] 40-41, 45, 47), Meton supplied the basic zodiacal scheme and recorded a few of the stellar observations, whereas Euctemon added the bulk of the stellar observations (compare Rehm, "Parapegma," *RE* 18.4 cols. 1340-41). This is, of course, pure speculation. It is not improbable, however, that either Meton or Euctemon used a scheme of zodiacal months. The Babylonians may already have divided the ecliptic into 12 zodiacal signs of equal length by about 500 B.C. (Sachs, *JCS* 6 [1952] 49-75; compare Aaboe and Sachs, *Centaurus* 14 [1969] 1.11-20); moreover, this division of the ecliptic is assumed in technical and non-technical literature of the fourth century (see, for example, Neugebauer, *HAMA*, p. 593). Indeed, the Greek terms for the zodiacal months, terms also applied to the zodiacal signs and to the zodiacal constellations, are translations

3.1 THEORETICAL REQUIREMENTS

Such a parapegma or almanac requires little in the way of theory: there is no model involved, that is, no mathematical analogy correlating the celestial horizon-phenomena with some geometric construction. (Please note that we are using 'model' in a precise sense to signify a mathematical analogy between phenomena and some domain of numbers or a geometrical representation, an analogy which serves as the basis for arithmetic and/or geometrical computation: models so construed are not to be confused with pictures, as they are by Samuel,[76] for example.) Now Rehm[77] and others[78] claim that Euctemon distinguished true and visible risings and settings;[79] and, moreover, that he used a celestial globe marked with the zodiac and the important fixed stars to determine the true phenomena and their dates geometrically by rotating this globe with respect to a horizontal plane. This claim is not credible. Not only is there no evidence of astronomical concern in the fifth century with such theoretical constructs as the true conjunction and opposition of the sun with various fixed stars, concern of this sort is inappropriate to the parapegma tradition. It is also important to bear in mind that it was not until the fourth century that Greeks possessed a theory enabling the construction of a celestial globe which could be used as Rehm and van der Waerden suppose; thus, the burden falls on these scholars and those who agree with them to prove on independent grounds that such an instrument was actually used by astronomers in the fifth century. But perhaps we should state the reasons for our skepticism in greater detail.

First, instead of a distinction between true and visible phenomena, we prefer one between theoretical constructs and (visible) phenomena. Our reason is that in either case, the first disjuncts are unobservable and so cannot be described as phenomena: indeed, these constructs are intelligible only in the context of a theory or model of celestial motion; and, consequently, one should not assume without specific evidence that such is the context for the parapegma tradition. (The adjective 'true' as applied in astronomy does not always signify something unobservable: for example, when one distinguishes true and mean motions, the latter alone are unobservable, theoretical constructs.) In the second place, when one considers the reconstructed fragments from Euctemon's parapegma, the supposedly clear distinction of ἐκφανής for visible risings and ἐπιτέλλει for theoretical risings in a few entries is muddied by the fact that one cannot be sure in most cases whether the latter signifies a theoretical or a visible rising.[80] The same holds true of κρύπτεται for visible settings and δύνει for theoretical settings: in general, there is no way to decide whether the latter refers to a visible or to a theoretical setting.[81] In addition, given that the practical value of a parapegma lies in its treating astronomical events at the horizon as signs or indicators and correlating them with meteorological changes (the *significata*), it would be odd to introduce theoretical and, hence, unobservable events as signs. Moreover, the literary tradition which lies behind and is the context of the invention of the parapegma is limited to relating the weather to *visible* astral horizon-phenomena [see below]. All the phenomena listed in Hesiod's

from Akkadian, the language of Babylonia (compare Pannekoek, *HistAst*, pp. 49-50, 106). Dicks' denial ("Euctemon," *DSB* 4, p. 460) that Euctemon used a zodiacal scheme seems unreasonable, especially since it is not accompanied by any argument. Still it is important to bear in mind that the mere use by Meton and Euctemon of a scheme of zodiacal months need not presuppose their direct knowledge of the ecliptic and its division into 360 parts.

76. *Greek and Roman Chronology*, pp. 23-26.
77. *Sitzungsberichte der Heidelberger Akademie der Wissenschaften*, phil.-hist. Kl. 4.3 (1913) 30 n. 2.
78. For example, Pritchett and van der Waerden, *BCH* 85 (1961) 37-38, 45: compare van der Waerden, *AHES* 29 (1984) 107.
79. This distinction is made at Ptolemy, *Phaseis* 6.3-26.
80. Compare Pritchett and van der Waerden, *BCH* 85 (1961) 38.
81. Compare van der Waerden, *AHES* 29 (1984) 107.

Opera et dies are visible[82] as are those in Ptolemy's *Phaseis*; the distinction of true and apparent phenomena (our theoretical constructs and phenomena) occurs in the preface to book 2 of Ptolemy's work and is probably meant to enable casting the data of the parapegma into a more precise mathematical framework. For, after determining what is now called the *arcus visionis*, that is, the least angle defining the depression of the sun below the horizon when a stellar phenomenon can be seen at the horizon, one posits an empirical basis for predicting the theoretical stellar event.[83]

In sum, we are not persuaded that Euctemon is to be credited with a distinction between theoretical events which are unobservable and (visible) phenomena. As for the text of this parapegma, there are two possibilities. Either the reconstruction is at fault or, in such entries as 'Sirius rises [ἐπιτέλλει]' (Cancer: day 27) and 'Sirius is apparent [ἐκφανής]' (Leo: day 1), we should understand respectively 'Sirius is visible for the first time in the morning in the east near the horizon' and 'Sirius is visible near the eastern horizon.' It is worth noting that the ambiguity of ἐπιτέλλει in Euctemon's parapegma has an analogue in Enuma Anu Enlil, a Babylonian text compiled in the seventh century B.C., but drawing on material which derives in part from the early second millennium.[84] In this text, the words IGI, IGI.LÁ, and SAR may mean 'rise(s) heliacally', 'rise(s)', and 'is/are visible'. And similarly, NU IGI may mean 'do(es) not rise heliacally' and 'is/are not visible'.[85] Such usage parallels what one finds in Greek parapegmata; yet there is no ground to suppose that the Babylonians used geometric models or a celestial globe, or to think that these terms refer to theoretical events.[86]

Consequently, in our view, the claim that Euctemon worked with a celestial globe would have to be defended on different grounds: it is not sufficient to argue from considerations of Euctemon's parapegma alone. And, as we have said, the burden of proof must rest with those who would make this claim because the construction of such a globe seems out of place in the fifth century. Not until Eudoxus do we have evidence of celestial mapping as opposed to mere description of the heavens. We say this for several reasons.[87] First, there is ample documentation in the ancient literature confirming that Eudoxus mapped the fixed stars by means of certain celestial circles. Next, the earliest *dated* reference to celestial bodies which mentions circles in the heavens is in a report of a comet in -340:[88] since Aristotle also writes of two earlier comets observed in -426/5 and -372/1 (343b1-7) but does not locate these comets by referring to circles on the celestial sphere, we suggest that this system for mapping the celestial sphere was probably introduced between -372 and -340. Moreover, there are no traces in the fifth century of the corresponding sort of geographical mapping that one expects of those who understand what we have called the two-sphere model; but there is ample testimony that Eudoxus mapped the earth by referring to celestial circles. Thus, since Eudoxus seems to have been the first to exploit the mathematical analogy of the celestial and terrestrial spheres in this way, we have argued that he was its inventor.

Further, as Aujac[89] notes, the main evidence for the construction of spherical models of the heavens belongs to the third century, though there are hints of this activity in the fourth as one would expect, if it was Eudoxus who first introduced a suitable system for mapping.[90] Even if

82. M.L. West, *Hesiod's Works and Days, Edited with Prolegomena and Commentary* (Oxford: Oxford University Press, 1978), pp. 379-80.
83. See Neugebauer, *HAMA*, pp. 926-31.
84. E. Reiner and D. Pingree, *Babylonian Planetary Omens. II: Enuma Anu Enlil, Tablets 50-51* (Malibu, CA: Undena Publications, 1981), Bibliotheca Mesopotamica 2.2, p. 1.
85. Reiner and Pingree, *Omens*, pp. 16-17.
86. Compare Reiner and Pingree, *Omens*, p. 6 and n. 26.
87. Compare Goldstein and Bowen, *Isis* 74 (1983) 330-40.
88. Aristotle, *Meteor.* 345a1-8.
89. *Revue d'historie des sciences* 23 (1970) 95-107.
90. See Cicero, *De re pub.* 14.21-23; Goldstein and Bowen, *Isis* 74 (1983) 335 and n. 94.

there were solid globes in the fifth century, they would surely not have been more precisely marked than those of the fourth. But globes from the fourth century were most likely unusable for the purpose suggested: so far as we can tell, they not only lacked colures and meridians, they were not rotated around the equatorial poles within a horizon-ring to show the motions of the heavens.[91] In other words, though the theory for some sort of celestial mapping was developed in the fourth century, the literary and material evidence indicates that the construction and use of celestial globes was not adapted immediately to the astronomical and mathematical questions this new theory raised.

Finally, though fourth-century schemes for the rising of a star which is in conjunction with the sun rely on geometrical models, what one finds is not a distinction between theoretical constructs and phenomena as such but a rule for invisibility that is probably based on considerations of symmetry, a situation one would not anticipate if Rehm and the others were right about Euctemon. Eudoxus probably assumed in his parapegma that phenomena will be visible if the sun is ½ zodiacal sign below the horizon; Autolycus, who was a younger contemporary of Eudoxus, certainly makes this assumption in his *De ortibus et occasibus*.[92]

The only theoretical assumption needed for making a parapegma is that there are periodic or cyclical recurrences of correlations between astronomical and meteorological phenomena, correlations which thus serve as a basis for prediction. These correlations were assuredly crude: How likely is it that a specific change in weather will occur at a given place over the course of many years when a certain stellar phenomenon occurs at the horizon? This question of accuracy is important but difficult: though we may wish to say that, as a matter of fact, a parapegma is not very accurate at all, we must at the same time be careful not to think that the parapegmatist thus failed to achieve his purpose. As we will argue, the parapegma tradition derives in part from two literary genres which were well established throughout Greece and the Near East by the fifth century [see §3.2]. And there is evidence that its purpose relates in part to medical practice and town planning [see §5.3]. Accordingly, when we say that a parapegma is predictive, we mean only that it is in general a rough guide for conduct, an indication based on celestial signs of relative risk, say, to aid farmers, sailors, and others as they go about their livelihoods. And for this purpose, the data of common lore, that unscientific repository of local experience and convention, will suffice. We do not deny, of course, that later astronomers may have been concerned with the precise dating of astral horizon-phenomena in parapegmata. Our point is that such concern (so far as it goes beyond refining calendric cycles) is alien to the parapegma tradition as such. In the parapegma itself, the datings were probably quite rough and there was no real interest in accumulating the observational data needed to put the correlations on a sound empirical basis. If one follows van der Waerden[93] in recognizing certain similarities between Euctemon's parapegma and ^{mul}Apin, then it is best to remember that the datings of phenomena in ^{mul}Apin, a Babylonian text compiled in the seventh century, are schematic.[94]

To construct a parapegma one must also identify stars and constellations. Now the evidence in Greek sources of early star groupings is quite scanty.[95] Still, what we do have indicates that these

91. See E. Savage-Smith and A.P.A. Belloli, *Islamicate Celestial Globes: Their History, Construction, and Use* (Washington, DC: Smithsonian Institution Press, 1984), Smithsonian Studies in History and Technology 46, pp. 1-11.

92. Compare Neugebauer, *HAMA*, pp. 760-61.

93. *AHES* 29 (1984) 110-13: compare Pritchett and van der Waerden, *BCH* 85 (1961) 41-46.

94. Reiner and Pingree, *Omens*, pp. 6-9. Unlike van der Waerden (*AHES* 29 [1984] 101-14), who identifies the paths of Ea, Anu, and Enlil as circles which are parallel to the celestial equator, Reiner and Pingree (*Omens*, pp. 7, 17-18) view these paths as segments of the horizon at Babylon.

95. See, for instance, Cleostratus of Tenedos, Frr. A3-4, B1-3 in H. Diels and W. Kranz, (eds.), *Die Fragments der Vorsokratiker* (3 vols., 6th ed.; Dublin/Zurich: Weidman, 1951) 1, pp. 39-40.

star groupings were offered without any system for recording their positions or mapping them. Indeed, the groupings in the sixth and early fifth centuries seem little more than a vehicle for mythology. This means that one should not assume that sixth- and fifth-century writers refer to the same star grouping when they use the same name.[96] Nor may one suppose that, with the advent of a system for mapping the celestial sphere in the time of Eudoxus, the constellations so identified and located are the same as those intended in preceding ages. We draw two conclusions from this: first, the business of identifying stars and star groupings is historically prior to the parapegma tradition; and second, it is often hazardous to speak of the accuracy of the dates for astral horizon-phenomena in the early parapegmata, since we cannot identify the particular star groupings with certainty.

3.2 LITERARY ANTECEDENTS

The roots of the parapegma tradition lie in two literary traditions found throughout ancient Near Eastern cultures and both of which may well be Mesopotamian in origin:[97] omen literature and wisdom literature. The omens we have in mind are astral.[98] The pattern of these omens is 'If such and such happens in the sky, then this will happen to the king, (to the state, to the weather)' and their purpose is always directive.[99] Thus, for example, in Enuma Anu Enlil[100] one reads:

> [Text ix 11] The Demon with the Gaping Mouth [*scil.* Cygnus and a part of Cepheus] sets in month IV, it rises in month [. . .]; if this star rises early:[101] the king of that land will defeat his enemy; if this star rises later: his enemy will defeat the king of that land, will conquer the [nobles].
> [Text ix 12] In month I the Star of the Field [*scil.* α, β, γ Pegasi with α Andromedae] [. . .]; if it rises heliacally at its specified times: the irrigated land and the cultivated lands will not prosper, [the rivers?] will not bring [their high waters?].
> [Text ix 13] In month II, the Bristle [*scil.* the Pleiades], the Seven Gods (the great gods); if it rises heliacally at its specified time: the great gods will assemble and give counsel to the land, good winds will blow; if it rises heliacally not at its specified time: (the great gods will assemble and) will give bad counsel to the land, evil winds will blow, there will be grief for the people.

Just as there is an extensive corpus of Near Eastern omen literature which antedates and is contemporary with the Greek parapegma tradition, there is also a considerable body of wisdom literature (proverbs, fables, didactic essays, disputations), so named because this literature offers secular advice concerning how one should live one's life in the face of ordinary, everyday problems.[102] For present purposes, one especially interesting document in this tradition is a

96. Compare Reiner and Pingree, *Omens*, p. 2.

97. Compare S.N. Kramer, *History Begins at Sumer* (Garden City, NY: Doubleday, 1959).

98. Compare Sachs, *JCS* 6 (1952) 49-75; Pannekoek, *HistAst*, pp. 36-47.

99. A.L. Oppenheim, *Ancient Mesopotamia: Portrait of a Dead Civilization* (Chicago: University of Chicago Press, 1964), pp. 124-27; Neugebauer, *Publications of the Astronomical Society of the Pacific* (=*PASP*) 58 (1946) 113-14.

100. Reiner and Pingree, *Omens*, p. 59.

101. As Reiner and Pingree (*Omens*, pp. 16-17) explain, the terms "early" and "late" pertain to the introduction of intercalary months in the lunar calendar in order to keep Nisanu (month I) in the spring season.

102. Compare R.B.Y. Scott, *The Anchor Bible: Proverbs, Ecclesiastes. Introduction, Translation, and Notes* (Garden City, NY: Doubleday, 1965), pp. xvi-xviii; J.A. Wilson, (tr.), "The Instruction of the Vizier Ptah-hotep," in J.B. Pritchard (ed.), *The Ancient Near East: An Anthology of Texts and Pictures* (Princeton: Princeton University Press, 1958), pp. 234-37; Wilson, (tr.), "The Instruction of Amen-em-Opet," in Pritchard, *The Ancient Near East*, pp. 237-43; H.L. Ginsberg, (tr.), "The Words of Ahiqar," in Pritchard, *The Ancient Near East*, pp. 245-49; Kramer, *History Begins at Sumer*, pp. 119-42.

didactic almanac addressed by a father to his son and correlating the proper farming activities with the changes of the seasons throughout the course of the year.[103]

Viewed from the perspective of these two literary traditions, then, the *Opera et dies*, a lengthy didactic poem written by Hesiod (ca. 700 B.C.) purportedly advising his brother on the way to live an honest and productive life, would appear to be an early example in Greek literature of the attempt to synthesize the literary conventions of the didactic almanac and astral omens. For Hesiod's advice includes not only proverbs and maxims, it also contains instructions on managing the farm and seafaring according to the seasons indicated by the risings and settings of certain fixed stars. Thus, this poem by Hesiod, a poem which has more in common with the literature of the Near East than its contemporary literature in Greece,[104] brings to Greece those intellectual motifs or conventions which are essential to understanding the expository form and purpose of the parapegma. And it is in terms of these conventions that one should assess speculation about the theoretical foundations and empirical accuracy of the parapegma invented by Meton and Euctemon.

4. METON AND THE INEQUALITY OF THE SEASONS

If we credit Oenopides of Chios with recognizing the obliquity of the ecliptic,[105] then it seems reasonable to allow that the Greeks in the latter half of the fifth century were paying attention to the sun's motion and, in particular, that their awareness of the inequality of the seasons was probably the basis of their realizing that the sun's motion is not uniform throughout the year. But, if we concede this, must we also grant that they recognized solar anomaly or that their divisions of the year into seasons of different lengths are based on observation? For our part, we do not think that Meton and Euctemon should be said to have discovered the solar anomaly, since this requires the motion of a mean sun. It is one thing to realize that the sun's motion is not uniform throughout the year and another to analyze this lack of uniformity as a difference between where the sun is and where it would be if it moved uniformly. Moreover, the concept of a mean motion is theoretical and there is no evidence that Meton and Euctemon had the necessary conceptual framework. As for the question of observation, we will argue that the schemes for the season lengths attributed to Meton and Euctemon, Callippus, and the author of the *Calendarium* are interrelated; and that none of these schemes requires observations of the solstices and equinoxes.

In the *Ars Eudoxi*,[106] a papyrus whose text goes back to the second century B.C. and displays the

103. Kramer, *History Begins at Sumer*, pp. 65-69.

104. M.L. West, "Hesiod," in N.G.L. Hammond and H.H. Scullard, (eds.), *The Oxford Classical Dictionary* (=*OCD*), (2nd ed. rev.; Oxford: Oxford University Press, 1973), p. 511.

105. Theo Smyrnaeus, *Expositio*, 198.14-16 with Diels' reading of λόξωσιν for διάζωσιν; compare Fritz, "Oinopides," *RE* 17.2 col. 2260; and n. 75. Diels' emendation is speculative though not impossible. Theon's report, which ultimately derives from Eudemus, makes good sense as it stands: the assumption that Oenopides must have been concerned with the obliquity of the zodiac rather than the zodiacal belt (that is, with the organization of the zodiac into constellations or even into signs) relies heavily on testimony which is itself highly speculative (see Aëtius, *De placitis reliquiae* 2.12.2, in H. Diels, [ed.], *Doxograph graeci* [Berlin: Reimer, 1879]; Diodorus Siculus 1.98.2; Macrobius, *Saturnalia* 1.17.31: compare Bulmer-Thomas, "Oenopides," *DSB* 10, p. 179). J.L.E. Dreyer (*A History of Astronomy from Thales to Kepler* [2nd ed.; New York: Dover, 1953), p. 38) retains the latter reading but interprets Theon's report to mean that Oenopides did discover the obliquity of the sun's path to the celestial equator. Of course, it is improper on either reading to speak of Oenopides as the first discoverer: compare Pannekoek, *HistAst*, p. 106.

106. Cols. 22:24-23:15 (Blass, *Eudoxi*, p. 25).

state of astronomy in the third,[107] one finds the schemes in Table 4 for the lengths of the four astronomical seasons, that is, of the four seasons defined by the equinoxes and solstices, in a year of 365 days.

	Summer Solstice	Autumnal Equinox	Winter Solstice	Vernal Equinox	Summer Solstice
	Summer	Autumn	Winter	Spring	
Democritus	[91]	91	91	[92]	
Euctemon	90	90	92	[93]	
Eudoxus	[91]	92	91	[91]	
Callippus	92	89	90	[94]	

TABLE 4. Schemes for the Lengths of the Four Astronomical Seasons
For values restored in the column for the summer season, see Tannery, *Hist. de l' astron.*, p. 294; Neugebauer, *HAMA*, pp. 627-628.

The reliance on the norm of a 365-day year and the fact that all the astronomers mentioned are parapegmatists suggest that for each of them the seasonal division is connected with his parapegma. In all likelihood this information about the season lengths supposed by Euctemon and the others just derives from their parapegmata and has no independent status. In other words, we think it probable that none of these astronomers undertook a special program of observation designed to determine the lengths of the seasons.

In Rehm's reconstruction[108] of the parapegma of Meton and Euctemon, the solar year as represented in Figure 3 is divided into 7 zodiacal months (Cancer through Capricorn) of 30 days and 5 zodiacal months (Aquarius through Gemini) of 31 days. This pattern for the difference in the length of the seasons is obviously not based on direct observation. As a species of schematizing, it resembles the Babylonian solar theory of System A [see Figure 4]: both divide the ecliptic into a fast and a slow zone.[109] These schemes, however, are not the same: the slow arc in System A runs from Pisces 27° to Virgo 13°, whereas for Meton and Euctemon it extends from the beginning of Aquarius through all of Gemini. Thus, Meton and Euctemon recognized that the seasons do vary in length and may have adapted a Babylonian way of thinking to represent this variation in their parapegma. Their scheme is itself computed: it assumes that

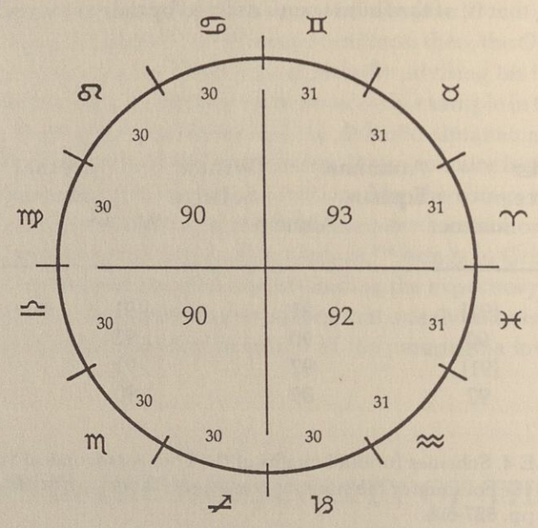
$$1^y = 365^d = 12 \cdot 30^d + 5^d$$

107. Neugebauer, *HAMA*, pp. 600, 686-87.

108. *Sitzungsberichte der Heidelberger Akademie der Wissenschaften*, phil.-hist. Kl. 4.3 (1913) 9 and 30.

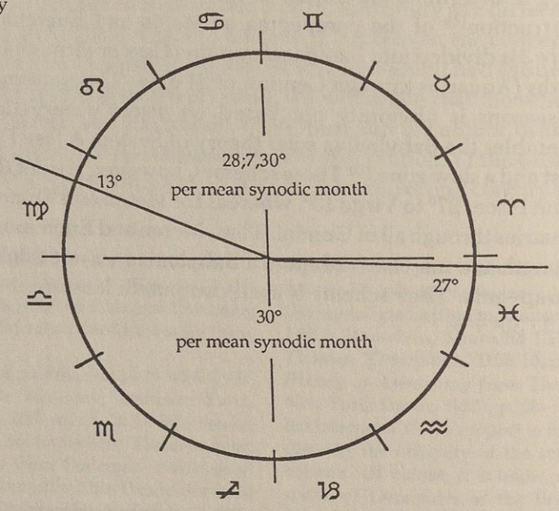
109. So Pritchett and van der Waerden, *BCH* 85 (1961) 45; compare Neugebauer, *HAMA*, p. 628 and n. 43.

FIGURE 3. Meton and Euctemon: Zodiacal Calendar



Aries	♈	Libra	♎
Taurus	♉	Scorpio	♏
Gemini	♊	Sagittarius	♐
Cancer	♋	Capricorn	♑
Leo	♌	Aquarius	♒
Virgo	♍	Pisces	♓

FIGURE 4. Babylonian System A: Solar Theory

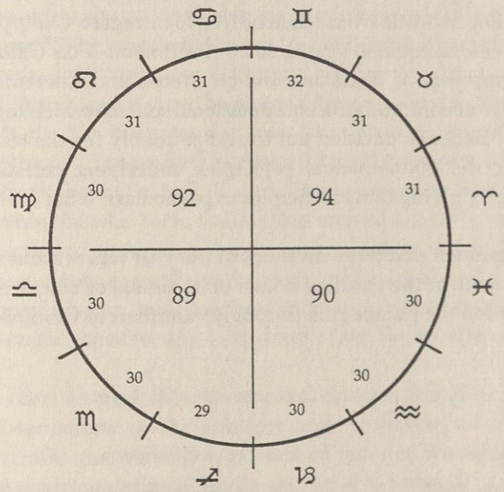


and then economically distributes the 5 days among the 12 months. So it has no basis in direct observation of the four cardinal points of the zodiac.[110]

Columella[111] reports that both Eudoxus and Meton located the equinoctial and solstitial points at 8° of the appropriate signs. Were this true, we would have yet a further hint of possible Babylonian influence, since it is characteristic of System B that the cardinal points occur at these positions.[112] But Columella's claim is suspect. In Neugebauer's opinion,[113] Columella refers to Eudoxus and Meton merely to gain credit for an antiquated norm: not only is there good evidence that Eudoxus actually put the cardinal points at the midpoints of their zodiacal signs,[114] what we know of the transmission of the sexagesimal system makes it unlikely that either Meton or Euctemon worked with a division of the ecliptic into degrees. Euctemon appears to have placed the cardinal points in the first degree of their signs (i.e., at points corresponding to Aries 0°, Cancer 0°, and so on): this follows from his parapegma, since the solstices and equinoxes are dated on day 1 of the sun's entry into their respective signs. Accordingly, if one is going to speculate about where Meton put the cardinal points, it would be more reasonable to suppose that he adopted the norm used by Euctemon, a norm unattested in Babylonian astronomical texts.[115]

Now it is often thought that Callippus' scheme must be based on observation because it agrees so well with the facts.[116] Nevertheless, Callippus' season lengths may be derived from those of Meton and Euctemon. Consider the scheme in Figure 5 for the zodiacal months in Callippus' parapegma as reconstructed by Rehm.[117]

FIGURE 5. Callippus: Zodiacal Calendar



110. Compare Toomer, "Meton," *DSB* 9, pp. 338-39.
111. *De re rust*. 9.14.12-13.
112. See, for example, van der Waerden, *AHES* 29 (1984) 104.
113. *HAMA*, p. 596.
114. Compare Neugebauer, *HAMA*, pp. 598-600.
115. Neugebauer, *HAMA*, p. 600.
116. So, for example, Toomer, "Meton," *DSB* 9, p. 338; Neugebauer, *HAMA*, p. 627.
117. "Parapegma," *RE* 18.4 cols. 1346-48. For reservations concerning this reconstruction, see Neugebauer, *HAMA*, pp. 628-29.

This scheme may be obtained from Meton's and Euctemon's by rotating their day lengths for the zodiacal months counterclockwise two zodiacal signs (so that the interval of slow motion ends at the beginning of Virgo) and then removing 1 day from Sagittarius and adding it to Gemini, the sign opposite to Sagittarius. This relation to the scheme of Meton and Euctemon for the lengths of the zodiacal months, then, suggests that the agreement of Callippus' scheme with the 'facts' (especially in its assignment of more time to the sun's passage from vernal to autumnal equinox than from autumnal to vernal equinox) may be coincidental and not the result of observing solstices and equinoxes as Kieffer[118] and others maintain. Indeed, one can argue that Callippus' scheme seems only to be a product of considerations of symmetry. For Meton and Euctemon, the line of symmetry extends from the midpoint of Libra to the midpoint of Aries; but perhaps Callippus chose to adapt their scheme in order to establish a line of symmetry between the midpoints of Sagittarius and Gemini and to give greater prominence thereby to the summer solstice as the first day of the solar year.

If Callippus' sequence of zodiacal months is not in fact based on new observations of the solstices and equinoxes, then we can better understand a remark Aristotle makes in modifying Callippus' homocentric models for the sun and moon. According to Simplicius,[119] Eudemus explains that Callippus added two more spheres to Eudoxus' model for the sun so as to accommodate the inequality of the seasons, an inequality affirmed earlier by Meton and Euctemon.[120] But Aristotle, it appears, considered the possibility of not adding these two spheres[121] and thus of following Eudoxus and Democritus in ignoring the inequality of the seasons. This would be surprising—given Aristotle's claim to concern for observations by experts—if Callippus' addition of the spheres for the non-uniform motion of the sun was founded on a division of the year into seasons which was derived from observation.[122] It is considerably less so, however, if Callippus' scheme is only an adjustment of Meton's and Euctemon's in the interest of symmetry. For Aristotle would then be free to disregard Callippus's scheme in favor of one which made the seasons equal in length; so his position *vis-à-vis* Callippus would not differ substantially, then, from that of Eudoxus *vis-à-vis* Meton and Euctemon. In either case, the question was whether to accommodate a computational scheme which supposes that the seasons are unequal in length: Eudoxus decided not to and probably for the reason that he was more interested in showing the mathematical principles underlying celestial motion (especially retrogradation) than in applying these principles to particulars; what Aristotle finally decided is unclear.[123]

To reinforce our argument that these divisions of the year into seasons may not have been the result of observing the sun at the cardinal points in its annual circuit, we will also consider the seasonal division found in the parapegma (wrongly) ascribed to Geminus [see Figure 6].

118. "Callippus," *DSB* 3, pp. 21-22.

119. *In libros Aristotelis de caelo commentaria*, (J.L. Heiberg [ed.]; Commentaria in Aristotelem Graeca 7, Berlin: Academia Littararum Regia Borussica, 1894), 497:13-22.

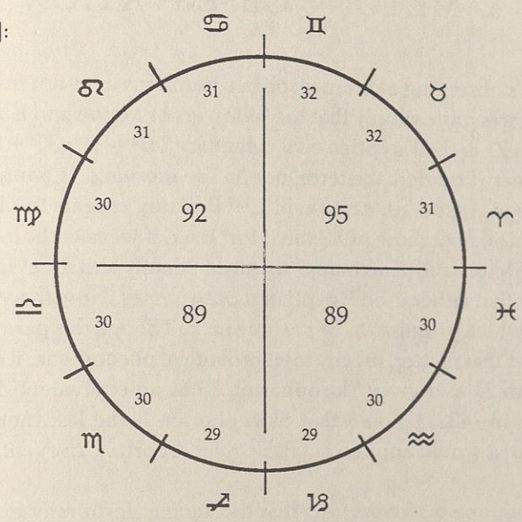
120. We are not convinced by van der Waerden's contention (*AHES* 29 [1984] 115-24) that Callippus' account of the different season lengths is based on an eccentric model with apogee at Gemini 15°. Such a claim is too difficult to reconcile with what we do know of early Greek astronomy (see Goldstein and Bowen, *Isis* 74 [1983] 330-40) and with the fact that all the independent evidence concerning Callippus' theory of celestial motion is limited to his work on the Eudoxan model of homocentric spheres.

121. *Metaphysica* 1073b38-1074a15; compare Simplicus, *In de caelo* 503:10-28.

122. So Neugebauer, *HAMA*, p. 627.

123. Compare *De caelo* 291b29-292a9.

FIGURE 6. [Geminus]: Zodiacal Calendar



This scheme suggests the relative insignificance of observation in such divisions, since there is no real improvement on Callippus' values: though the value for the interval from vernal to autumnal equinox is better (and even became a standard in the parapegma tradition), that for the autumnal to vernal equinox is worse.[124] The lengths of the summer and autumn months are exactly the same as for Callippus. The only departure from Callippus' scheme consists in the removal of 1 day from winter and its addition to spring. And the place of the increment is obviously determined by arithmetical considerations. For the extra day may have been removed from Capricorn and added to Taurus so that the differences between month lengths above and below the equinoctial line form the arithmetical sequence 1, 2, 3, 2, 1, 0 as one reads from the vernal equinox. Alternatively, it is possible that the basic assumption underlying the change was that, for the zodiacal months from vernal to autumnal equinox, each month of spring should be 1 day longer than the month of the summer opposite to it. Such arithmetical uniformity might seem an improvement on Callippus' scheme, in which the months from vernal equinox to summer solstice are respectively 1 day longer, equal to, and 1 day longer than the months of summer opposite to them.

We see little reason, then, to think that the seasonal division found in the *Calendarium* was predicated on new observations of the solstices and equinoxes, or to accept the unduly complicated and historically questionable argument of van der Waerden[125] that it derives by computation from an eccentric solar model with apogee at Gemini 15°.

124. According to Ptolemy (*Alm.* 1.232:4-238:49), the astronomical seasons are 92½, 88^1/$_8$, 90^1/$_8$, and 94¼ days in length, beginning with summer. If one adapts this to a year of 365 days by ignoring the extra ¼ day and combining the ½ days to make 1 day, one may derive season lengths of 92, 88, 90, and 95 days, the very distribution Ptolemy uses in his *Phaseis*. In both the *Almagest* and the *Phaseis*, Ptolemy assumes that the sun takes 187 days to travel from the vernal to the autumnal equinox, the same period found in the [Geminus] *Calendarium*.

125. *AHES* 34 (1985) 231-39.

5. METON'S OBSERVATION

The story of Meton's observing a summer solstice in Athens does not inspire confidence. One source, Ptolemy,[126] writes quite simply that the followers of Meton and Euctemon observed this solstice on Phamenoth 21 in the Egyptian civil calendar ($365^d = 12 \cdot 30^d + 5^d$) at sunrise (πρωίας: not 'at dawn' as Toomer[127] renders the term, nor 'in the morning' as Samuel[128] has it) in Athens during the archonship of Apseudes. At *Alm.* iii 1,[129] Ptolemy repeats this but mentions only the followers of Euctemon and not those of Meton. Moreover, if we take the locution here translated as 'the followers of Meton and Euctemon' to mean Meton and Euctemon, then we have a problem: it is unlikely that either used Egyptian month names. Now there is a parapegma from Miletus dated -109/8 which promises to be of some help. Though this parapegma does not name any of its sources or, for that matter, list any meteorological phenomena, it does record a summer solstice for Phamenoth 21 and gives Skirophorion 13 as an equivalent date.[130] So, given that Apseudes was archon in -432/1[131] and that Skirophorion is the last month of the year in the Athenian civil calendar, it would appear that Ptolemy is reporting an event on -431 Skirophorion 13 (Phamenoth 21).

Having come this far, one discovers next that the ancient testimony is not particularly clear about what actually happened on this date. Ptolemy reports an observation of a summer solstice, but Philochorus of Athens (born before 340 B.C.) claims only that Meton erected a *heliotropion* [see §5.2] at some time during Apseudes' archonship.[132] And Diodorus Siculus[133] writes that on Skirophorion 13 Meton made public and inaugurated his 19-year cycle.

Assessing such divergent testimony is difficult. What one can say is that by the time of Ptolemy, there was a tradition that Meton did something of importance on -431 Skirophorion 13, a date which was taken to be equivalent to Phamenoth 21 in the Egyptian calendar and which in turn corresponds to June 27 in the Julian calendar. Modern scholarship goes further: it gives preference to technical sources (Ptolemy, the Milesian parapegma) and seeks to reconcile the others to them.[134] Thus, the consensus today is that Meton used a sundial to observe a solstice on this day in order to establish a starting point for his parapegma, a device which, as we have said [§3], was to be used in conjunction with his 19-year cycle. In this section, we will consider the question of Meton's observation under three headings: the date, the instrument and its location, and the purpose.

5.1 THE DATE

There are difficulties in claiming both that Meton observed a summer solstice on Skirophorion 13 and that Skirophorion 13 in -431 corresponds to Phamenoth 21 (June 27). If Meton is thought to have observed the summer solstice on -431 June 27 at sunrise (4;40^h: all times are given in Athens Apparent Time), the first problem is that this solstice actually occurred on June 28 at about

126. *Alm.* 1.205:15-23; compare 203:7-12.
127. *Ptolemy's Almagest*, p. 138; compare Goldstein, *Isis* 76 (1985) 117.
128. *Greek and Roman Chronology*, p. 47.
129. 1.206.10-13.
130. See Rehm, "Parapegma," *RE* 18.4 col. 1300; Neugebauer, *HAMA*, pp. 588-89: compare Toomer, *Ptolemy's Almagest*, p. 138 n. 22.
131. Compare Bickerman, *Chronology*, p. 138.
132. See the scholium on Aristophanes, *Aves* 997 (Jacoby, *FrGH* III.B 1, pp. 135, 496).
133. 12.36.1-3.
134. Compare, for example, Samuel, *Greek and Roman Chronology*, pp. 44-45.

TÜRK TARİH KURUMU KÜTÜPHANESİ

9;15^h,[135] and so should have been observed by Meton at sunrise on June 28. (We reiterate that all observations are of horizon-phenomena.) Such an error is perhaps excusable: solstices are hard to observe because the sun's daily motion at these points is much slower than elsewhere in its yearly course. Thus, for an observer in Athens, the change in the sun's azimuth from sunrise on June 27 to sunrise on June 28 is 0.04°, which is not observable by the naked eye. And the change in the sun's altitude from culmination (i.e., apparent noon) on June 27 to culmination on June 28 is even smaller. Or, as Geminus says,

> around the tropic points, they [*scil.* the lengthenings of the days and nights] come to be very small and imperceptible, so that for roughly 40 days the length of the days and nights remains the same,[136]

an assertion which indicates that the sun appears to stand still in its annual motion along the horizon during this period. So one may choose to overlook the error of 1 day in the date of the solstice.

What we cannot overlook, however, is the consequence that, if Meton made his observation on Skirophorion 13, then Skirophorion 1 began at sunset on June 14. Yet the sun and moon were in true conjunction on June 16[137] at 8;45^h and the *earliest* the new moon could have been seen in Athens is after sunset on June 17, which corresponds to Skirophorion 4 rather than to Skirophorion 1 [see Figure 7]. So, if the month is to start with the first visibility of the moon [see n. 20], the date in the lunar calendar, Skirophorion 13, is in error by at least 3 days. That is, what the tradition reports as Skirophorion 13 should in the best case be Skirophorion 10. Thus, if Meton was engaged in a serious program of observation, he was curiously inattentive to the behavior of the moon.

This problem has not gone unrecognized. Van der Waerden[138] proposes that Meton and Euctemon started each month in their calendars with the conjunction of sun and moon. He begins by taking Skirophorion 13 as equivalent to June 27; and then he argues that Skirophorion in -431 was a month of 30 days that ended at sunset of July 14 (17 rather than 16 days after Skirophorion 13) because there was a true conjunction on July 15[139] at 19;02^h. This means that Skirophorion 1 began at sunset of June 14; and also that Skirophorion 1 is to be taken as a 'mean' conjunction, since true conjunction occurred on Skirophorion 2 (June 16).

Van der Waerden's analysis relies unduly on Geminus' account of Euctemon's procedure for arranging his 19-year cycle into a pattern of 29-day and 30-day months [see §5.1], a pattern which presumably defines what van der Waerden here calls a 'mean' conjunction. As for external evidence that months were reckoned from conjunction in the fifth century, van der Waerden

135. Here and in many of the subsequent calculations of ancient astronomical phenomena according to modern principles as well as of Julian Day Numbers (JDN), we are relying on a computer program developed and kindly supplied to us by Professor Peter J. Huber (Harvard University). Where appropriate we have also consulted B. Tuckerman, *Planetary, Lunar, and Solar Positions (601 B.C. to A.D. 1) at Five-day and Ten-day Intervals*, Memoirs of the APS 56 (Philadelphia: American Philosophical Society, 1962). For criteria of visibility, see P.J. Huber, *Astronomical Dating of Babylon I and Ur III* (Malibu, CA: Undena Publications, 1982), pp. 24-25. On the ancient Egyptian calendar, see Toomer, *Ptolemy's Almagest*, p. 9.
136. *Intro. ast.* 6.29.
137. H. Goldstine, *New and Full Moons from 1001 B.C. to A.D. 1651*, Memoirs of the APS 94, (Philadelphia: American Philosophical Society, 1973), p. 48 No. 7043.
138. *AHES* 29 (1984) 107-109, 120-23; compare *Isis* 77 (1986) 104.
139. Goldstine, *Moons*, p. 48 No. 7044.

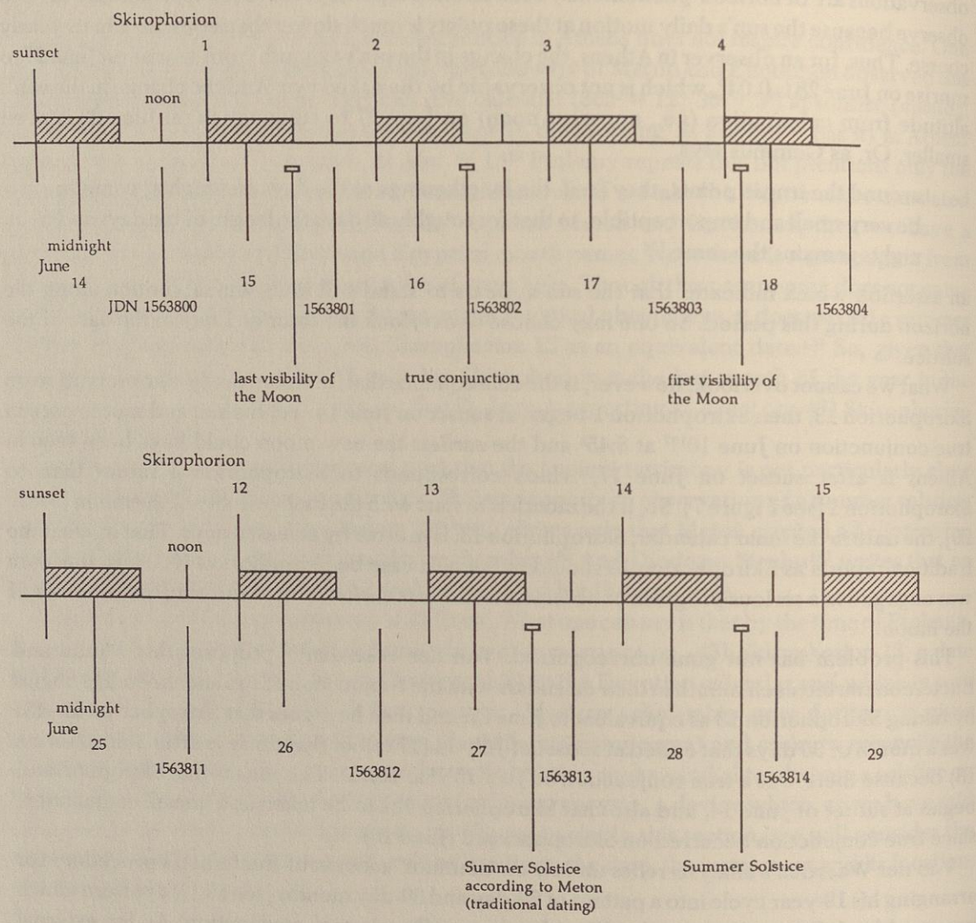


FIGURE 7. -431 Skirophorion (Athens)
Julian Day Numbers (JDN) are reckoned from noon.

adduces a few lines from Thucydides[140] and Geminus' definition of the month as the interval from conjunction to conjunction or from full moon to full moon.[141] But the passage from Thucydides, who was contemporary with Meton and Euctemon, is inconclusive:

> During the same summer, at the beginning of the month according to the moon (νουμηνίᾳ κατὰ σελήνην), the only time in fact at which it seems possible, the sun was eclipsed after midday; and, after it became crescent-shaped and some stars became visible, the sun returned to its original shape.

Thucydides' point may be only that solar eclipses occur near the beginning of the month, i.e., near the moon's first visibility. His reason for writing κατὰ σελήνην is more likely that the civil calendar did not always begin the month with the first visibility of the moon.[142] And, as van der Waerden recognizes, Geminus' definition of the month has less historical authority than his claim[143] that the days of the month have been named after the phases of the moon; as Geminus says, for example, 'The day in which the moon appears as new is called Newmoon by synaeresis.' Thus, there is no warrant here for van der Waerden's claim that the Greeks in the fifth century defined the first day of the month by the conjunction (or opposition) of sun and moon. And one is even less entitled to argue to this same conclusion by using as premises Geminus' definition of the month as the interval from conjunction to conjunction and the fact attested in later Greek literature that solar eclipses can occur only at true conjunction.[144]

As an alternative to van der Waerden's solution to the problem of correlating Skirophorion 13 and June 27, one might suggest that the lunar-calendar date, Skirophorion 13, was determined according to the last visibility of the moon, as was the practice in Egypt. But this too seems unsatisfactory. In theory, the moon was visible in Athens before sunrise on June 15,[145] the day immediately prior to conjunction. Thus, such a method of defining the month could theoretically reduce the error to 1 day. Of course, one might also suppose that Meton and Euctemon did not actually see the moon on June 15 and so thought its last visibility to be before sunrise of June 14. But this still is not much help, since the practice of reckoning months from the moon's last visibility is usually and most naturally associated with the practice of reckoning days from sunrise, as in Egypt; in Greece, however, the day started at sunset.[146] Accordingly, to establish the hypothesis that Meton assumed a month that began with the moon's last visibility, one needs independent evidence that fifth-century Greeks reckoned months in this way and somehow coordinated this definition of the month with their view that the day started at sunset.

It would seem that serious problems arise from accepting the equivalence of Skirophorion 13 and Phamenoth 21 (June 27) in the year -431. Moreover, these problems are not really solved by taking the first day of the month either as the day of the moon's conjunction (true or 'mean') with

140. 2.28.
141. *Intro. ast.* 8.1.
142. Compare A.W. Gomme, *A Historical Commentary on Thucydides* (2 vols.; Oxford: Clarendon Press, 1954, 1956, repr. 1962) 2, pp. 88-89.
143. *Intro. ast.* 8.11.
144. For similar reasons, then, we reject J.K. Fotheringham's contention (*Monthly Notices of the Royal Astronomical Society* 84 [1924] 383-92) that Meton began his month with the sunset *before* conjunction. Samuel (*Greek and Roman Chronology*, p. 45 n. 4), who follows Fotheringham and likewise thinks that Skirophorion 1 was a calculated date, confuses the issue by introducing computational errors: (a) the earliest possible occurrence of the moon's first visibility is in the evening of -431 June 17 (not, as Samuel believes, June 16, the day of true conjunction), which means that Skirophorion 13 would begin at sunset of June 29 (not June 28); (b) if Skirophorion 1 began at sunset of June 15, Skirophorion 13 would begin at sunset of June 27 and this means that the summer solstice was observed at sunrise of Skirophorion 12 (assuming with Samuel that it was observed at sunrise of June 27).
145. Compare Huber, *Astronomical Dating*, pp. 24-25.
146. Neugebauer, *HAMA*, p. 353; compare Samuel, *Greek and Roman Chronology*, pp. 13-14.

the sun or as the day of the moon's last visibility, rather than as the day of its first visibility. At this juncture, then, there are two alternatives: surrender the claim that Meton was trying to observe a summer solstice or reinterpret the equivalence of -431 Skirophorion 13 and Phamenoth 21.

The first alternative is too extreme. There is too much evidence that Meton was concerned with summer solstices. The *heliotropion*, the instrument mentioned by Philochorus, shows by the etymology of its name that it pertains to solstices.[147] The testimony of Diodorus that Meton made public and inaugurated his 19-year cycle on -431 Skirophorion 13 also points to interest in solstices: recall the purpose of this calendric cycle and the fact that the reconstructed parapegma of Meton and Euctemon begins with the summer solstice (Cancer: day 1). In addition, the Milesian parapegma connects Skirophorion 13, the date given by Diodorus, with the occurrence of a summer solstice.

So it is better, perhaps, to reassess the equivalence of Skirophorion 13 and Phamenoth 21. But this introduces some new alternatives. Either Skirophorion 13 is a date properly reckoned in relation to the moon or it is not. If it is properly reckoned, then Meton observed the solstice at sunrise of -431 June 30 (= Phamenoth 24)—a result which would seem tolerable, given that the annual motion of the sun along the horizon is slow at the solstices. There are no overriding considerations which make this hypothesis unacceptable *prima facie*, though it does leave the problem of explaining the later correlation of -431 Skirophorion 13 and -431 Phamenoth 21 (June 27). However, if Skirophorion 13 is not properly reckoned in relation to the moon, then this date would appear to belong to the Athenian civil calendar, a calendar noted in the fifth century for being out of step with the moon. On this hypothesis, there is little hope of correlating the date, Skirophorion 13, directly with any particular Julian date, since there is no way to discover its relation to the actual occurrence of new moon on -431 June 17. Still, if Meton observed the summer solstice, the problem is to determine whether he did so on -431 Phamenoth 21. And this brings us back to the question of the equivalence of Skirophorion 13 and Phamenoth 21 in the year -431, a correlation which either involves mistaking the date of Meton's observation with a date for the occurrence of the summer solstice or presupposes that a civil date actually corresponds to one that is astronomical.

In either case, this correlation is readily explained. Some centuries after Meton, someone using the Egyptian calendar computed that there was a summer solstice on -431 Phamenoth 21. He then identified this Egyptian date with the Athenian date for Meton's observation of a summer solstice in the same year. Whether he did this in ignorance of the fact that Skirophorion 13 was a proper lunar date or of the fact that Skirophorion 13 belongs to a civil calendar which was out of step with the moon (i.e., that Meton may not have observed the solstice on the right day), is indeterminable, though in either case the result is an error: all he probably had was the bare report that Meton observed the summer solstice on -431 Skirophorion 13, a report which he (uncritically?) took to mean that Meton observed the summer solstice on the right day and that this day was Skirophorion 13. Toomer[148] suggests that this identification was made by Hipparchus; we agree and offer specific reasons.

In our view, Hipparchus began with two parameters which he derived from the Babylonians. The first parameter is for the length of the (tropical) year in the 19-year cycle:

$$(13)\ 1^y = 235/19 \cdot 29;31,50,8,20^d = 365;14,48,33,35,47,\ldots^d \approx 365;14,48^d,$$

147. Compare S.L. Gibbs, *Greek and Roman Sundials* (New Haven: Yale University Press, 1976), p. 94.

148. *Ptolemy's Almagest*, p. 138 n. 22.

where 29;31,50,8,20 days is a Babylonian value for the length of the mean synodic month.[149] The second parameter is for the length, Δ_s, of the astronomical spring season according to System A [see Figure 4]:

$$(14)\ \Delta_s = \frac{90^\circ}{(28;7,30)^\circ} \cdot 29;31,50,8,20^d = 94\tfrac{1}{2}{}^d$$

From his observation of a vernal equinox on Phamenoth 1 (March 23) of -127 at sunset [JDN 1674753.2],[150] Hipparchus could have computed that the summer solstice occurred 94½ days later on Payni 6 (June 26) at sunrise [JDN 1674847.7]. (For the region between Athens and Babylon, the vernal equinox did occur near sunset on March 23; but the summer solstice took place at about $22;30^h$ of June 25.) Next, he calculated that between Meton's observation of a summer solstice at sunrise on -431 Skirophorion 13 and the summer solstice of -127 Payni 6, there had elapsed exactly 304 years. But, since

$$(15)\ 304^y = 16 \cdot 19^y = 16 \cdot 19 \cdot 365;14,48^d = 111035^d = 304 \cdot 365^d + 75^d,$$

Hipparchus concluded that in -431, sunrise of Skirophorion 13, the time of summer solstice, marked the beginning of Phamenoth 21 in the Egyptian 365-day calendar. In modern terms, Hipparchus thus computed that Meton observed the summer solstice at sunrise of -431 June 27 [JDN 1563812.7].

The Milesian parapegma (which dates from the closing years of the second century) faithfully reflects this computation. Toomer's remark[151] that there is no motive for using Athenian civil dates in Miletus is well taken but beside the point. If it were a civil date, it does not follow that the author of the parapegma knew this. In fact, it seems most likely that he simply took for granted Hipparchus' correlation of -431 Skirophorion 13 and Phamenoth 21 and so made the same error as Hipparchus (whichever of the two errors mentioned above it was), since the date this parapegma gives for the occurrence of summer solstice in -108 is also derived from Hipparchus' (computed) date for the summer solstice of -127.

According to the Milesian parapegma, there was a summer solstice on Skirophorion 14, which corresponds to Payni 11 in the Egyptian calendar, during the archonship of Polycleitus. Since the literary evidence that Polycleitus was archon in -109/8 is compelling,[152] this means that the parapegma puts the summer solstice on -108 Skirophorion 14 (Payni 11) [JDN 1681787.7]. (This date corresponds to -108 June 26: the solstice actually occurred on June 25 at about 13^h to 15^h for the region from Athens to Babylon.)

To derive the Egyptian date given in the Milesian parapegma for this summer solstice from Hipparchus' computed date for the summer solstice on -127 June 26 (Payni 6), assume that 19 years or 6940 days separate these solstices, i.e., that this parapegma is to be used with the Metonic cycle. Thus, given that the parapegma is defined by a 365-day year, since

$$(16)\ 19^y = 6940^d = 19 \cdot 365^d + 5^d,$$

it follows that the summer solstice of -108 occurred at the very start of Payni 11. It remains to find the equivalent date in a calendar using Athenian month names [see Figure 8].

149. Compare N.M. Swerdlow, *AHES* 21 (1980) 292-300.

150. Ptolemy, *Alm.* 1.196:18-21) with Toomer, *Ptolemy's Almagest*, p. 134.

151. Neugebauer, *HAMA*, p. 617 n. 10; compare Toomer, "Meton," *DSB* 9, pp. 337-38; van der Waerden, *AHES* 29 (1984) 123-24.

152. Compare Samuel, *Greek and Roman Chronology*, p. 45 n. 4.

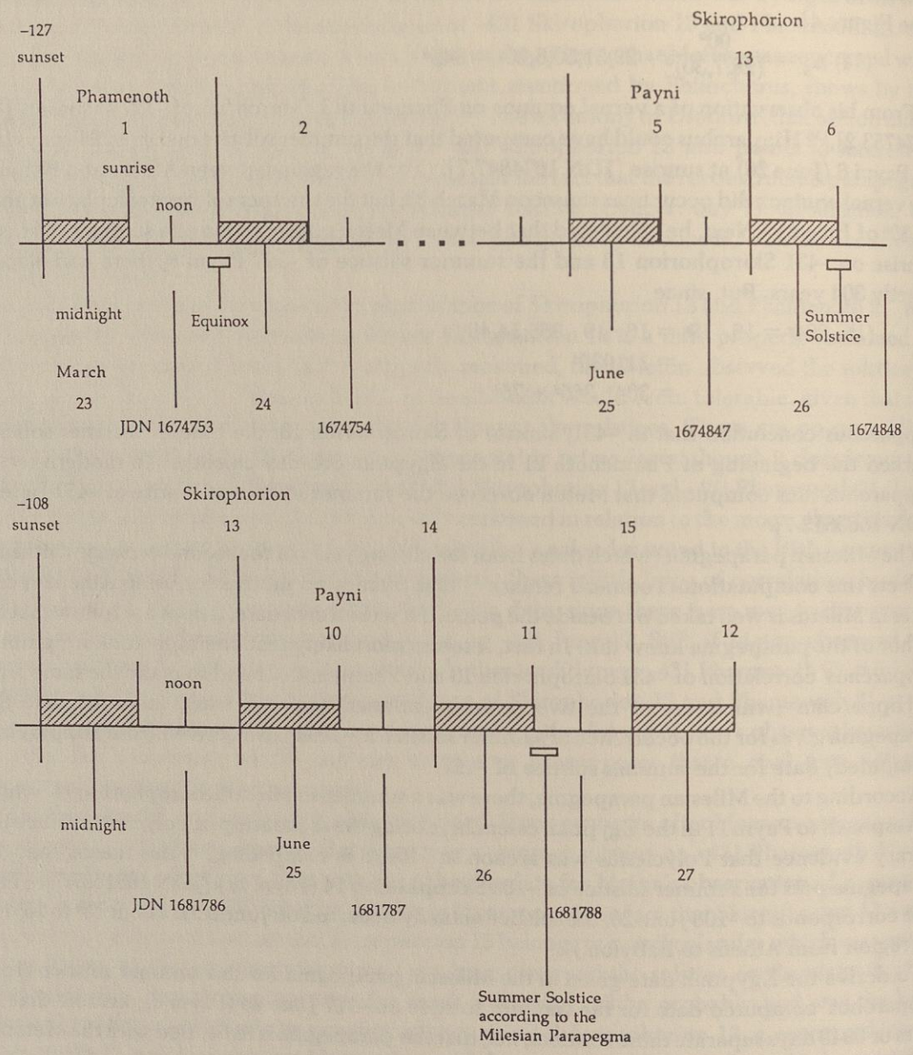


FIGURE 8. Computation of Summer Solstice in -108

Following Hipparchus, sunrise on -431 Skirophorion 13 is to coincide with the beginning of -431 Phamenoth 21. Now assume that, after the lapse of 304 years or 111035 days separating sunrise on this day from the sunrise marking the beginning of -127 Payni 6, the Hipparchan calendar begins its next cycle. Thus, Payni 6 in -127 corresponds to -127 Skirophorion 13. But

(17) $304^{y} = 111035^{d} = 11 \cdot 6940^{d} + 5 \cdot 6939^{d}$,

that is, in the Hipparchan 304-year cycle there are 16 19-year cycles, 11 of 6940 days and 5 of 6939 days. So, in the Hipparchan scheme, if the first of these 19-year subcycles in the 304-year cycle (i.e., the subcycle which begins at sunrise on -127 Payni 6 [JDN 1674847.7]) is one of these 5 shorter subcycles and contains 6939 days, then the second subcycle starts 6939 days later at sunrise of -108 Payni 10 [JDN 1681786.7]. Since days are added or removed at the end of the month, i.e., the 6939-day cycles differ from the 6940-day cycles in having 1 full month more and 1 hollow month less, the start of -108 Payni 10 corresponds to sunrise of -108 Skirophorion 13. This means that the start of -108 Payni 11 (June 26: JDN 1681787.7), the day which comes 6940 days after -127 Payni 6, corresponds to sunrise -108 Skirophorion 14.[153] In this way the Milesian parapegmatist may have derived the date of the summer solstice in -108 from Hipparchus' computed date for summer solstice in -127.

Let us return now to our two hypotheses about -431 Skirophorion 13 and the relation of this date to the moon. As we said before, if this date is properly specified in relation to the new moon, then Meton observed the summer solstice on June 30. This means that Hipparchus and the Milesian parapegmatist are mistaken in correlating Skirophorion 13 with Phamenoth 21; that is, they err in assigning Meton's observation a date which is equivalent to June 27. But if Skirophorion 13 belongs to the Athenian civil calendar of the late fifth century, then Hipparchus and the parapegmatist may indeed be right that this observation took place on June 27. On balance we prefer to think that -431 Skirophorion 13 was a date in the civil calendar at Athens, since it seems to us unlikely that Skirophorion 13 belonged to an astronomical lunar calendar.

If the date of Meton's observation, -431 Skirophorion 13, was identified with Phamenoth 21 in the manner we have suggested, then there remains little support for the view stated by Toomer[154] and van der Waerden[155] that Meton used or developed a lunar astronomical calendar which borrowed Athenian month names. As we see it, the only calendar Meton established was the zodiacal calendar of 365 days found in his parapegma, and he used the 19-year cycle to coordinate this zodiacal calendar and the Athenian civil calendar (which was lunar but erratic). This is, of course, what one finds in the parapegma of Euctemon and it is consistent with the citations of the Metonic parapegma that appear in the later tradition.[156] For the same reasons, we are skeptical about the worth of Geminus' account of Meton's *enneakaidekaeteris* [see §2], an account accepted by van der Waerden [cf. n. 27] and Samuel:[157] Geminus assumes that the

153. There has been considerable debate about the Milesian parapegma and the interval it posits between the summer solstices of -127 and -108. Many of the accounts and revisions proposed are extravagant in their presuppositions. Van der Waerden, for example, works from the premises that the parapegma is based on the Callippic cycle and that months are reckoned from conjunction; Samuel suggests instead that the parapegma utilizes a Metonic cycle and reckons months from the sunset prior to the moon's first visibility, though he is not entirely satisfied with this (compare Samuel, *Greek and Roman Chronology*, p. 45 n. 4). But most important, in our view, is the fact that such proposals go astray in taking it for granted that at least one of the dates -431 Skirophorion 13 (Phamenoth 21), -127 Payni 6, and -108 Skirophorion 14 (Payni 11) is not computed.

154. "Meton," *DSB* 9, pp. 337-38.

155. *AHES* 29 (1984) 123-24.

156. This does not mean that Meton intended his cycle to improve or reform the civil calendar (see n. 62); our thesis is only that by this cycle Meton was able to adapt this civil calendar to his parapegma and so make the latter useful to the general populace.

157. *Greek and Roman Chronology*, p. 43.

Metonic cycle is intended to define a lunar calendar of 19 years for the parapegma.

But, though we prefer the view that -431 Skirophorion 13 is a date in the Athenian civil calendar, we do not find Hipparchus' computation that Phamenoth 21 or June 27 is the date of Meton's observation of the summer solstice particularly compelling. After all, Hipparchus' dating of the observation, a dating accepted by later writers (including the author of the Milesian parapegma[158] and Ptolemy[159]), does not really address the question of how Meton knew when to look or that he was looking at the right time.

So, the question now is, How did Meton decide on the date of Skirophorion 13 for the summer solstice of -431? We doubt very much that he did it by looking, whether with or without an instrument: the tradition speaks of only one observation, yet no single observation will yield this information. Instead, we propose that Meton learned of this date in the same report in which he learned of the 19-year cycle. The most economical hypothesis is that Meton learned the summer-solstice date when he learned that

$$19^{y} = 235^{m} = 110 \cdot 29^{d} + 125 \cdot 30^{d} = 6940^{d}.$$

That is, he simply used the Babylonian date for summer solstice which figures in the Uruk solstice scheme and its predecessors [see §2.1]. This hypothesis is attractive because it supposes a matrix of information which connects plausibly all the various aspects of Meton's calendric contribution, a Babylonian matrix which was (we think) available to fifth-century Greek astronomers [see §6.1]. Moreover, since the usual Julian date for the summer solstices according to these Babylonian schemes is June 28, on this account the Athenian civil calendar was somewhat less aberrant in Skirophorion of -431 than Hipparchus' results would imply.[160]

5.2 THE PLACE AND THE INSTRUMENT

It is commonly assumed that the *heliotropion* was a sundial which Meton used to determine the day of summer solstice by observing the length of the noonday shadow.[161] Now a horizontal sundial can doubtless serve in this capacity—the shadow cast at noon is shortest on this day—though there is reason to doubt the accuracy of observations made in this way, since the differences in the length of the shadow cast on the days around the summer solstice will be small. The confidence scholars have in this hypothesis is based in large part on a very influential report by K. Kourouniotes and H. A. Thompson.[162] In this report, Kourouniotes and Thompson criticize on archaeological grounds the earlier view which took Philochorus[163] to mean that Meton's *heliotropion* was 'a dial consisting of a pointer set in the vertical face of a wall and throwing its shadow on a scale inscribed on the surface of the wall.' As they point out, the walls in the Pnyx proposed for this use face north (which is a very poor orientation for a dial) and none was actually available in Meton's day. In opposition to this earlier interpretation, they follow Rehm[164] and

158. It is unlikely that Hipparchus was the author of the Milesian parapegma, since he seems to have limited himself to the Egyptian calendar for specifying days (compare Toomer, *Ptolemy's Almagest*, p. 13).

159. It is worth noting that Ptolemy gives only the Egyptian date for Meton's observation of the summer solstice. Perhaps he was aware of the problems that arise when the Athenian date is taken to be astronomical (rather than civil).

160. The interesting question, then, is not, how did Meton determine -431 Skirophorion 13 to be the date of summer solstice? but, how did the Babylonians arrive at such an accurate schematic dating of this phenomenon? We do not have evidence for a definitive answer to this question at this time.

161. Compare, for example, Jacoby, *FrGH* III.B 10, pp. 496-97; Toomer, "Meton," *DSB* 9, p. 338.

162. *Hesperia* 1 (1932) 207-11.

163. Scholium in Aristophanes, *Aves* 997 (Jacoby, *FrGH* III.B 1 pp. 135, 496).

164. "Parapegma," *RE* 18.4 cols. 2147f.

maintain that the *heliotropion* consisted of an inverted hemispherical bowl (πόλος) with a vertical pointer (γνώμων), which was set out in the open on a base of some height. Their particular contribution to this understanding of the *heliotropion* lies in their identifying the physical remains on the Pnyx near a fortification wall of what they took to be the foundation for the podium for this sundial. Recently, however, in private correspondence [1982 July 20], Professor Thompson has kindly informed us that what he previously took to be the foundation of this sundial he now thinks was the base of a monument erected in the mid fourth century.[165]

In itself, this reassessment of the archaeological interpretation of Philochorus' report does not affect the thesis that the *heliotropion* was in fact a sundial (πόλος with γνώμων), though in practice it does make it easier to renew the question of what the *heliotropion* was. The first point to make in this regard is that during the fifth century astronomers seem, except perhaps in this case, to have limited their attention to horizon-phenomena. Next, one should notice that, of the few occurrences of the term *heliotropion* in later Greek literature, two are inconclusive by themselves;[166] and one treats this instrument as a hemispherical bowl-dial.[167] There are passages in Hellenistic literature, however, which suggest a different story. The scholiast on Homer, *Odyssey* xv 403-404,[168] a text which describes the island Syros as the location of the turnings of the sun, reports the explanation that there was a cave (σπήλαιον) by means of which the turnings of the sun were indicated. We interpret this to mean that this cave on Syros was oriented to the horizon in such a way that the sun's rays illuminated a certain wall or segment of a wall only on the day of solstice.[169] Such a device is not unheard of in later astronomy: Pliny[170] describes a well so oriented that its bottom is illuminated only by the noonday sun at summer solstice. Accordingly, we prefer the hypothesis that the *heliotropion* was a device aligned to a solstitial rising-point such that a part of it was illuminated only on the day of solstice [see n. 169].

5.3 THE PURPOSE

Though it has been thought by some that Meton observed the summer solstice in -431 so as to reform the Athenian civil calendar, it is now generally assumed that his purpose was to determine the epoch of his calendric cycle and parapegma. The main point of controversy concerns whether the day of the observation, Skirophorion 13, was to be the epoch itself[171] or whether the epoch was to be the day of the first visibility of the new moon next after this observation, that is,

165. Professor Thompson writes, "The evidence is very slight for dating the foundation bedding which I . . . proposed as a possible location for Meton's sundial. The care shown in laying out the bedding and the actual tooling certainly indicate a date in the high Classical Period, viz., the 5/4th cent. B.C. Beyond that we are dependent on the relation between the bedding and its surroundings. In our report in *Hesperia* 1 (1932) 207-211, . . . we assumed that the bedding could be as early as 433/2 B.C. But in the light of our greater knowledge of the history of the Pnyx, I am now more inclined to associate the row of five monuments, of which this bedding formed a part, with the third rather than the first period of the assembly place." Compare Thompson and Scranton, *Hesperia* 12 (1943) pls. 14 and 16; Thompson, *Hesperia* Suppl. 19 (1982) 143-44 and pl. 17.

166. For example, Diogenes Laertius, 1.119; Plutarch, *Dion* 29.2. Kourouniotes and Thompson (*Hesperia* 1 [1932] 208 and n. 1) remark that the *heliotropion* of Dionysius (who came to power in -404) may have been modeled on Meton's.

167. Athenaeus, *Deipnosophistae* 5.207e-f.

168. W. Dindorff, (ed.), *Scholia graeca in Homeram Odysseam ex codicibus aucta et emendata*, ii (Oxford: Oxford University Press, 1855) 2, p. 617:7-10.

169. One might be tempted to speculate that the *heliotropion* of Pherecydes of Syros, an astronomer of the late sixth century (Diogenes Laertius 1.119), was simply an instrument so oriented to the solstitial rising-points (compare H.T. Wade-Gery, *Essays in Greek History* [Oxford: Basil Blackwell, 1958], p. 2).

170. *Hist. nat.* 2.75.183.

171. See Diodorus Siculus 12.36.2; compare, for example, Samuel, *Greek and Roman Chronology*, pp. 44-45; Toomer, "Meton," *DSB* 9, pp. 337-38; van der Waerden, *AHES* 29 (1984) 104.

Hecatombaion 1 (-431 July 16).[172] But if we are right that Meton learned the date of the summer solstice in -431 from the Babylonians, then the story has to be somewhat different: either Meton used the *heliotropion* to confirm his calculations or his purpose in making the observation was not related to his 19-year cycle and the parapegma it governed.

It is unlikely, though admittedly possible, that Meton erected the *heliotropion* and used it to check his computations of the summer solstice, a procedure which would suppose prior knowledge of where this solstice occurs on the horizon. Given what we have said before about the motion of the sun around the solstices [§5.1], the attempt to confirm a calculation in this way would show only that the date calculated was one of a number of possible candidates for summer solstice. Moreover, no single observation would give the date of the solstice reliably. So, we think it more attractive to suppose that Meton did not observe the summer solstice in order to establish a starting point for his parapegma. Rather, his aim was to find out where the sun rose on the horizon on that day. In sum, we propose that in orienting a *heliotropion* to that part of the horizon where the sun rose on a predetermined date (which turned out to be Skirophorion 13 in the Athenian civil calendar), Meton hoped to determine an alignment.

As archaeoastronomers are well aware, concern for astronomical alignments, especially those determined by the summer and winter solstices, is common to many cultures.[173] The reasons for this vary from culture to culture, though the alignments seem usually to figure in religion (cosmology), ritual, and agriculture and, thus, often have profound social and political ramifications. Archaeoastronomers, of course, debate the significance of the alignments and what they entail, and there is good reason on balance for skepticism about claims that many of these cultures were capable of precise measurement or possessed what could plausibly be called an astronomical theory.[174] In general, the alignments in the cultures studied apparently entail astronomical observations for which the criteria of accuracy are primarily determined (so to speak) by the sufficiency of the alignments for non-astronomical (that is, social, political, and religious) purposes; as Aveni[175] suggests, it is by reference to such purposes that the case for alignments is best made. Still, our claim that Meton observed the summer solstice in order to determine an alignment needs to be examined on its own.

To understand why Meton, a parapegmatist, should seek to determine that point on the horizon where the sun rises on the day of summer solstice, we first adduce four texts in the Hippocratic corpus, *De aeribus aquis locis*, *De morbis popularibus* i and iii, *De natura hominis*, and *De diaeta*, texts which were written in the last half of the fifth century, the first two perhaps by Hippocrates himself and the third by his son-in-law, Polybus,[176] though the question of

172. See, for example, Heath, *Aristarchus*, pp. 293-95.

173. See, for example, J. Patrick, *Nature* 249 (1974) 517-19 (on Newgrange, Ireland); T. Hudson, G. Lee, and K. Hedges, *Journal of California and Great Basin Anthropology* 1 (1979) 39-63 (on various Indian groups native to California); Hedges in R.A. Williamson (ed.), *Archaeoastronomy in the Americas* (Los Altos, CA: Balena Press/The Center for Archaeoastronomy, 1981) (on the Kumeyaay Indians of San Diego County in California); S.C. McCluskey in A.F. Aveni (ed.), *Archaeoastronomy in the New World* (Cambridge: Cambridge University Press, 1982) (on the Hopi of northern Arizona); A.F. Aveni, H. Hartung, and J.C. Kelley, *American Antiquity* 47 (1982) 316-35 (on Chalchihuites in northwest Mexico).

174. See, for example, P.R. Freeman, *Archaeoastronomy* 1 (1979) 86-96; A. Ellegård, *Current Anthropology* 22 (1981) 9-125.

175. *Sky and Telescope* 72.5 (1986) 456-60.

176. See Joly, "Hippocrates," *DSB* 6, pp. 419-22; compare W.H.S. Jones (ed. and tr.), *Hippocrates* (Loeb series) 4, pp. xxvi-xxix.

authorship is not important for our argument.[177] These texts draw on the same conceptual framework as the parapegmata: both types of literature manifest the broadly Mediterranean view that order in Nature is not one of natures or natured things (as construed by Plato and Aristotle, for example) but one of the periodic correlation or conjunction of events.[178] In other words, both rely on astral omens connecting stellar and meteorological events; and both suppose that these omens are useful in deciding what to do, since the connections and what follows are periodic. The Greek medical literature of the fifth century does, of course, adapt these omens in a way not found in the parapegma tradition, by overlaying these omens with explanatory accounts that show how what happens in the heavens bears on health, and by stating explicitly what conduct these omens should ultimately entail. More specifically, medical writers of this period begin with astral omens and then connect meteorological events with health by way of considering the site of human habitations, and the quality of local airs and waters. These connections are predicated on the view that airs (πνεύματα) and regimen (διαίτημα) are the sources of disease.[179] As a species of argument, the early medical texts offer a curious blend of informal observation and speculation *a priori*,[180] though they doubtless served as the basis for arguments that were to become more systematic and perhaps empirical.

Thus, one reads in *De aeribus* 1-2[181] what amounts to a prescription for the proper conduct of the medical art. The author begins by requiring that the physician understand the effect of each season of the year and of the seasonal changes, of hot and cold winds (πνεύματα) both universal and local, and of the quality of waters, so that on arriving in a particular town (πόλις) he will be able to know to what diseases the inhabitants are liable by observing how their town is situated in relation to the winds and the solar risings, the local waters and earth or soil, and their regimen. In general, he says, by knowing the circumstances and times of the changes of the seasons and the stellar risings and settings, the physician will be able to foretell what sort of year it will be and will accordingly be best equipped to handle particular cases successfully.[182] And should someone think that such matters are μετεωρόλογα (literally, 'things appropriate to those who talk of what is high up in the air,' i.e., 'things fitting for astronomers'; but the sense may be sarcastic—talking of things on high, i.e., of what is not down to earth, is the mark of a fool), the author states that reflection shows that astronomy (ἀστρονομίη) makes a major contribution to medicine, since human diseases and digestive organs (κοιλαί) change with the seasons.

In subsequent chapters of the *De aeribus* the author maintains that sites exposed to different segments of the horizon are subject to different winds and so have different hygienic properties, where these exposures are defined by reference to the north-south line and by the points where the sun rises and sets at the two solstices (3-6). These same winds are said to affect the quality of the various types of water which in turn variously affect the health of those who drink them (7-9).

177. See Joly, "Hippocrates," *DSB* 6, pp. 418-31, for the argument that past attempts to distinguish to Coan and Cnidian schools of Hippocratic medicine are unsatisfactory, that the differences were emphatically stated and exaggerated by the ancients for polemical reasons since the schools were in point of fact quite similar.

178. It is perhaps by failing to see this distinction that Laroche (*RevPhil* 20 [1946] 119-20) misinterprets Plato (see n. 13) and misconstrues the theoretical background of early Greek medical writings.

179. Compare Anonymus Londinensis, *Iatrica* (see W.H.S. Jones [ed. and tr.], *The Medical Writings of Anonymus Londinensis* [Cambridge: Cambridge University Press, 1947]) 7.15-21; [Hippocrates], *De nat. hom.* 9.11-36.

180. Compare, for example, [Hippocrates], *De aeribus* 3 with Joly, "Hippocrates," *DSB* 6, p. 427.

181. Compare *De nat. hom.* 9.1-9, 36-44.

182. *De aeribus* 2.14-21; compare 10-11.

In order of importance, the most critical times of the year, according to the writer of the *De aeribus*, are the seasonal changes which occur at the summer solstice, the winter solstice, the autumnal equinox, and the vernal equinox. He also warns that physicians should beware of the heliacal risings of Sirius, Arcturus, and the Pleiades (10-11).

The specification of exposures in the *De aeribus* is echoed in later literature which defines the primary winds by referring to the north-south line, and to the solstices and equinoxes.[183] It is also worth noting that *De diaeta* iii 68.10-18 defines the seasons in terms of the Pleiades, the vernal equinox, and Arcturus[184] and that *De nat. hom.* 7-8 supposes the seasons to influence health by affecting the bodily humors. As for whether the author of the *De aeribus* was either describing current medical practice or commending a way of practice which others adopted, the reader should consult the four statements of the general circumstances of an illness or 'constitutions' (καταστάσεις) listed in *De morbis popularibus*. These constitutions each begin with a statement[185] of the predominating climatic circumstances during the time and at the place where the illness was contracted, and these climatic circumstances are defined by reference to those astral phenomena treated as most ominous by the author of the *De aeribus*. Thus, for example, the final constitution is specified climatically in terms of the visibility of Arcturus, the summer solstice, the autumnal equinox, and the heliacal rising of Sirius.

In sum, what we find in the medical and astronomical literature of the last half of the fifth century is the view that certain astronomical phenomena (among which are included, in particular, the summer solstice) are important in the course of human life not just for reckoning the days but because they signify important changes in the weather. This view eventually led to the emergence of a body of literature devoted to specifying more precisely the relationship between the astral events and the climatic changes they announce: several passages in Aristotle's *Meteorologica*, for example, aim to elaborate this connection.[186] Further, it is intimately connected with a concern for the proper or healthful orientation of dwelling places, a concern which is evident in the work of Hippodamus of Miletus, who lived in the fifth century and was responsible for planning Piraeus and Thurii,[187] and which is also found in later architectural treatises.[188]

This, then, is the context for understanding Meton's observation of the summer solstice in -431. We conjecture that his main purpose was to determine where the solstice occurred on the horizon and to establish an alignment thereby, an alignment which would be preserved by the *heliotropion* he erected for this purpose. Such an alignment would be of obvious interest to contemporary medical practitioners who wished to ply their art in accordance with the strictures of the author of the *De aeribus*. But there is testimony from Meton's contemporaries which suggests that this alignment was to be of use to him immediately.

Consider the depiction of Meton in Aristophanes, *Aves* 992-1020. It is striking that Meton is presented not as an astronomer but as a γεωμέτρης, a term which in the context clearly signifies a

183. Compare, for example, Aristotle, *Meteor.* 363a21-364a4; Vitruvius, *De arch.* 1.6.4-10.

184. Compare Aristotle, *Meteor.* 361b32-35.

185. *De morb. pop.* 1.1.1-13, 4.1-21, 13.1-3; and 3.2.1-15.

186. Compare especially *Meteor.* 361b36-362a31.

187. Compare R.E. Wycherley, *How the Greeks Built Cities*, 2nd ed. (London: Macmillan, 1962), pp. 17-21; A. von Gerkan, *Griechische Städteanlagen: Untersuchungen zur Entwicklung der Städtebaues in Altertum* (Berlin/Leipzig: de Gruyter, 1924).

188. See, for instance, Vitruvius, *De arch.* 1.4.1-8; 6.1-8, 12-13.

land-surveyor or town-planner.[189] It is the scholiast on this passage who asserts that Meton was also a very fine astronomer and explains why.[190] The same scholiast also reports the lines from Phrynicus' *Monotropos* (presumably a comedy about a misanthrope) in which Meton is described as δ τὰς κρήνας ἄγων (the one who directs/orients wells/springs/fountains), and concedes that Meton may have constructed a κρήνη in Colonus.[191] The question of what this κρήνη was, is by the scholiast's time well intertwined with the puzzle of what to make of Callistratus' claim that Meton erected some astronomical monument in Colonus.[192] For not only are the location and definition of Colonus disputed, so is the fact that Meton built anything there at all.[193]

This testimony about Meton from his contemporaries, Aristophanes and Phrynicus, and from the scholiast on *Aves* 997 is admittedly not decisive in matters of great particularity. Still, it would be wrong to dismiss it, as Toomer[194] apparently does, because the primary documents preserving this testimony are comedies. Unguarded skepticism about the possibility of interpreting these comic references too easily extends to any ancient text: all such texts are written for a purpose, be it to inform, to amuse, or whatever; so the historian's problem is always the same—to discern and extricate historical fact from what is written for purposes other than those of the historian, by those who were not historians in anything like the modern sense. Accordingly, since this testimony is consistent with what one finds in the contemporary medical literature, and since this literature clearly acknowledges a debt to what we have called the parapegma tradition, two facts Toomer ignores, we think it plausible that Meton, the parapegmatist, was by the nature of his trade or profession concerned with alignments for purposes of orienting buildings or roads[195] or even streams/fountains.[196] And such concern, we suspect, was the context for his erecting and using a *heliotropion* to determine the location on the horizon where the sun rose in the morning Skirophorion 13 in -431, a date he knew beforehand to be that of summer solstice.

189. Compare *Nubes* 200-205 with K.J. Dover (ed.), *Aristophanes, Clouds* (Oxford: Clarendon Press, 1968), pp. 122-23. Though we tend to agree with Tannery (*Hist. de l'astron.*, pp. 12-13) that Meton was not known as an astronomer by his contemporaries, we admit the possibility that the humor in Aristophanes' characterization of Meton in the *Aves* consists in showing an astronomer babbling about how he plans to lay out a lid-shaped (see *Nubes* 96 with Dover [ed.], *Clouds*, pp. 106-107) aerial city using instruments appropriate to land-survey.

190. Compare F. Dübner, *Scholia graeca in Aristophanem* (Paris: Firmin-Didot, 1877), p. 233:16-17.

191. Dübner, *Scholia*, p. 233:35-37.

192. Dübner, *Scholia*, p. 233:18-19.

193. Dübner, *Scholia*, p. 233:19-30. Jacoby (*FrGH* III.B 2, pp. 403-404) refers to the bibliographical passages about Meton in the works of Plutarch and Aelian (see n. 2 above), and suggests that Meton did not dedicate anything to Colonus but only lived there.

194. "Meton," *DSB* 9, p. 339.

195. In the *Aves*, Meton's plan for laying out the πόλις is to arrange it as spokes radiating from the hub of a wheel (where the hub is the marketplace) or, to follow Aristophanes, as rays of light from a star. The nonsense about squaring the circle may involve more than an allusion to the mathematical question of the day, a question which was not settled in the fifth century (compare B.B. Rogers [ed.], *The Birds of Aristophanes* [London: George Bell, 1906], p. 138). Rather, it may recall that contemporary "theory" (compare Wycherley, *Cities*, p. 29) in town planning favored the gridiron arrangement which Hippodamus of Miletus promoted (see Wycherley, *Cities*, p. 9 and n. 4, pp. 17-18; compare Gerkan, *Städteanlagen*), a "theory" which found little application in well-established πόλεις like Athens. Early writers (such as those of the Hippocratic texts cited above and Aristotle) do not say anything about how streets should be oriented; Vitruvius (*De arch.* 1.6) maintains that the streets should be arranged so as to exclude certain winds. As Wycherley (*Cities*, pp. 31-32) observes, in practice, the Hellenic disposition of streets in planned cities was determined primarily by the land's contours; on level ground there were no fixed rules: if there was a preference (and convenience permitted), it was for streets running in the north-south and east-west directions.

196. It is perhaps by assuming that Phrynicus is referring to the astronomical monument mentioned by Callistratus that Rogers (*The Birds*, p. 137) takes the κρήνη to be a water-driven clock. M. Lang (*Waterworks in the Athenian Agora* [Princeton, NJ: American School of Classical Studies at Athens, 1968], p. 2) writes that "Meton is credited with providing a fountain." What Phrynicus writes, however, suggests only that Meton oriented some source of water and not that he built one.

6. CONCLUSION

In the preceding interpretation of the fragmentary reports concerning Meton of Athens, we have reconstructed Meton's contribution in early Greek astronomy by paying close attention to the state of astronomy and Greek intellectual culture in the fifth century B.C. The most striking result we have reached is that Meton's contribution may be understood fully without assuming that early Greek astronomy was predicated on the accumulation and analysis of records of precise observational data obtained with or without the aid of instruments.

In our view, Meton, like other astronomers of the fifth century, was engaged in a variety of interrelated activities, the primary focus of which was the construction of a parapegma or almanac for the use of such non-astronomers as farmers, sailors, and physicians. The parapegma itself had deep roots in Mediterranean culture. Thus, the correlations of stellar and meteorological phenomena which it incorporated are written in the same spirit as earlier Babylonian omen and wisdom literature, though these types of literature were mediated by other cultures and by earlier Greek writers such as Hesiod. Consequently, these correlations were not really subject to observational control. Meton's parapegma was specifically indebted to the Babylonians in that it was organized according to a zodiacal calendar, since the division of the ecliptic into 12 signs of equal length was a Babylonian innovation. This zodiacal calendar was of 365 days, a year length which may be based on tradition rather than on contemporary observations of celestial phenomena. As for the division in this parapegma of the year into the four astronomical seasons, this too was probably not based on observations of the solstices and equinoxes and certainly should not be described as an account of solar anomaly: Meton's division simply adapts the solar theory found in Babylonian System A, that is, the rule that the ecliptic be divided into a fast and a slow zone, to the requirement that the year consist of 365 days or 12 months.

Central to the development of Meton's parapegma was the 19-year cycle of 235 synodic months or 6940 days. This *enneakaidekaeteris* was likewise borrowed. The Babylonians were the original proponents of the equation of 19 years and 235 months, a relation which was ultimately embedded in the Uruk solstice scheme: this purely arithmetical scheme which standardizes its predecessors and defines the annual occurrences of solstices and equinoxes in relation to the heliacal rising of Sirius is organized according to a 19-year cycle of 235 months. It is our contention that Meton learned of this relation in a report based on this scheme or one of its predecessors, which also stated that there were 125 full months and 110 hollow months (that is, 6940 days) in the 19-year cycle. With this identification of 19 years or 235 months with an integral number of days, Meton had a calendric structure well suited for keeping his parapegma, which was essentially a solar cycle, in step with the moon, a necessary condition for coordinating dates in the parapegma with dates in the Athenian civil calendar. Moreover, we conjecture that Meton also learned that the summer solstice was to occur in -431 on a date which turned out to be Skirophorion 13 in the Athenian civil calendar and is most likely June 28 in the Julian calendar [see §2.1].

Consequently, Meton's observation of this summer solstice from the Pnyx using a *heliotropion* was not an attempt to determine when the solstice occurred. Nor do we think his purpose was to confirm his calculation of the date of summer solstice. Rather, Meton erected the *heliotropion*, a device which catches the sun's image just as the sun rises on the day of solstice, in order to establish an alignment. And his reason for this was closely connected, we think, with his primary interest in the parapegma and its use: for Meton, like his contemporaries in the fifth century, believed not only that astral and meteorological phenomena are important in matters of

agriculture and navigation, but also that the orientation to them of human habitations and water supplies is critical in matters of health and well-being.

The preceding account of fifth-century Greek astronomy and Meton's contribution has an obviously negative force. Given that we lack evidence of a sustained program of astronomical observation in the sixth and fifth centuries, any coherent and plausible interpretation of astronomical activity which avoids positing that such a program was carried out at this time renders the assumption of such a program superfluous. In other words, one consequence of our reconstruction is that those who suppose that early Greek science began with the careful accumulation of observational data will have to defend this thesis directly. Moreover, since theory and observation are a doublet—the understanding of what an astronomical theory is and what it is supposed to do is interdependent with the understanding of what counts as an observation, what observations are of, and how they are made—to cast doubt on the usual account of early Greek astronomical observations in the way that we have done is also to call into question the corresponding view of early Greek astronomical theory. Thus, if Greek astronomy did not begin with a preliminary period in which celestial phenomena were closely observed, then it is unlikely that astronomical theory in the early fourth century, for example, was derived from extensive empirical data by some process such as induction, or that this theory was intended to provide an explanatory framework for such data. And this means in turn that it will be necessary to evaluate anew the representations and criticisms of astronomy found in the writings of Plato and Aristotle, as well as in the works of those like Democritus (whose life overlapped with Meton and Plato), Eudoxus, Callippus, and Autolycus.

With this in mind, the reader will perhaps discern that the preceding account also has a positive force, and suggests a different view of early Greek astronomical theory. In its broad outlines, fifth-century astronomy as we have reconstructed it seems to involve a number of interrelated activities devoted to meeting social needs. It is fundamentally a τέχνη or craft and not what Platonists and Aristotelians came to call an ἐπιστήμη or explanatory science. Perhaps the best way is to describe it as *heuristic*.[197] Take the gradual refinement of calendric cycles, for instance. If one abandons the thesis that such refinements in the value for the length of the year as are evident in the 59-year cycle of Oenopides, the *octaeteris*, and the *enneakaidekaeteris* are the result of closely observing the heavens, then no longer can these cycles be treated as theoretical relations induced or abstracted from empirical data which may be extended and used to verify or confirm them. On the contrary, one should regard these cycles only as solutions to a problem, as schemes to control the parapegma, itself an instrument with a variety of social uses. Such solutions or schemes are subject to a variety of practical and aesthetic criteria: they are to be judged by how well they serve in addressing the problem (relative utility), how well they adapt to more precise definitions of the problem (adaptability), as well as by their simplicity or economy and elegance.

Fifth-century astronomy so conceived is ill suited to the fourth-century prescriptions for knowledge and astronomical science offered by Plato and Aristotle. It undoubtedly fails to count as theoretical (and, hence, as truly scientific) for either writer. At the same time, it cannot be an applied science, since there is in this case no theory to apply. The problem in fourth-century historiography is that the best sources, Plato and Aristotle, are philosophers primarily engaged in developing their own theories of the objects and nature of knowledge: by interpreting astronomy

197. See Goldstein, *Centaurus* 29 (1986) 279-81.

through the lens of their own reflections in epistemology and ontology, they failed to see that earlier astronomy was a craft-like activity with practical goals and an intellectual content that does not fit their requirements for, and classification of, what they called science.

6.1 BABYLONIAN INFLUENCE

It is impossible, of course, to prove that Meton's accomplishments have to be understood in the way we have described: what we offer is an account which coheres with the evidence available and is consistent with what else is known of Greek intellectual culture during the fifth century. Ultimately, our reconstruction supposes that Meton was heavily indebted to Babylonian astronomical activity. Such debts are also difficult to prove, though the reader will, we trust, distinguish influence conveyed indirectly and that which had to reach him directly. Moreover, the reader should mark that, with regard to direct influence, we have not claimed for Meton any firsthand knowledge of Babylonian cuneiform documents and of the arithmetical schemes they manifest; such a claim would be implausible, given the extreme difficulty of reading technical cuneiform tablets and the lack of any evidence that such documents were available in Athens in Meton's time.[198] All we require is that Meton be apprised of two important but very general results: that $19^{y} = 235^{m} = 6940^{d}$ and the date when the summer solstice occurs.

Theophrastus[199] writes that Meton learned of the 19-year cycle from Phaeinos, a metic or resident alien in Athens. That there came to be a large number of metics in Athens in the latter parts of the fifth century is well known: Athens relied on them in developing its commercial enterprises and for taxes; and the name 'Phaeinos' is not Greek in origin. Theophrastus also adds that Phaeinos and many other fine astronomers observed τὰ περὶ τὰς τρόπας (solstitial phenomena) and that Phaeinos did so from Mount Lycabettus. This claim, though useful in classifying Phaeinos as an astronomer, is ambiguous and may in fact be an interpolation: first, it is unclear whether Theophrastus means that each of the three astronomers listed observed only one solstice or whether each was engaged in a lengthy program of observation; and second, though Theophrastus appears to suggest that Phaeinos made his observations from Mount Lycabettus, the context shows that Theophrastus' subject is the observation of meteorological phenomena about certain natural prominences, that is, the use of local meteorological events as signs. As Tannery[200] remarks, Lycabettus is not usable for such a purpose: elsewhere Theophrastus mentions only Parnassus and Hymettus in this connection for observers in Athens. Tannery conjectures that Phaeinos was actually observing the annual variations of the shadow of Lycabettus; in other words, Tannery suggests that Phaeinos was treating Lycabettus as a gigantic gnomon. This is certainly possible. And if there is any point in proliferating hypotheses, ours is that Phaeinos may have been using Lycabettus to establish an alignment between it and where the sun rose on the horizon at the solstices.[201] Be that as it may, Theophrastus' report is consistent with our reconstruction of Meton's accomplishment.

198. This may be the basis for Samuel's recommendation (*Greek and Roman Chronology*, pp. 21-22) that to understand early Greek astronomy properly one must understand the intellectual setting in Greece, a recommendation we do endorse. However, his statement " 'Babylonian influence' may be a red herring, and a much more economical hypothesis may allow us to find Greek bases for the work of Meton and his associates," seems wrong-headed because it does not treat Greek culture in the sixth and fifth centuries as an integral part of the Mediterranean milieu.

199. *De signe tempestatum* (F. Wimmer [ed.], *Theophrasti Eresii opera quae supersunt omnia* [Paris: Didot, 1866]) 4.

200. *Hist. de l'astron.* pp. 17-19.

201. According to Pannekoek (*HistAst*, p. 107), who thinks that the observations in question were intended to determine when the solstice occurred, Phaeinos used the irregular profile of Lycabettus to distinguish small variations in the sun's azimuth at sunrise and thus was able to determine the day of solstice.

A final word: to say that much of Meton's contribution consisted in adapting fundamental results in Babylonian astronomical theory does not mean that it is derivative and inconsequential. The very process of adapting these results to alien assumptions (for example, that the day is a basic unit of time) and transforming them by ignoring the arithmetical schemes needed to justify and interpret these results, is momentous in the history of early Greek astronomy: it was a critical stage in the evolution of that peculiarly Greek way of doing astronomy.[202]

202. The authors gratefully acknowledge the comments and suggestions made on a previous draft of this paper by H.C. Avery, J.P. Britton, G.E.R. Lloyd, K.P. Moesgaard, H.A. Thompson, and A. Turner.

Warrior, Devastating Deluge, Destroyer of Hostile Lands:

A Sumerian Šuila to Marduk

JERROLD S. COOPER

INTRODUCTION

The Sumerian mother-tongue community was extinct by the end of the Old Babylonian period, and may have disappeared long before.[1] But Sumerian lived on for nearly a millennium and a half, permeating every aspect of the written culture of Babylonia and Assyria, and was studied as well in the peripheral areas from Egypt to Elam that at one time utilized the cuneiform writing system. There is an understandable tendency to disdain later Sumerian with its overburden of Akkadian interference and its hopeless deviation from proper grammar (meaning the grammar of the Sumerian texts from Old Babylonian Nippur or perhaps Ur, where good Sumerians such as Ninurta-mushtāl[2] and Damqi-ilishu[3] inscribed our classical corpus of Sumerian literary texts). Yet during its centuries of use as what Walter Ong calls a "male language," that is, a language that no one learned as a mother-tongue, but was taught in the essentially male environment of the school for religious or administrative purposes,[4] Sumerian did not simply degenerate. It was highly productive, even innovative, both textually and lexically, although P. Michalowski has recently demonstrated that what has been long accepted as post-Old Babylonian innovation might well turn out to have demonstrable Old Babylonian origins. A single tablet has confirmed the suspicions of others that the *eršaḫunga*, a type of individual prayer in the Emesal dialect of Sumerian with phraseology characteristic of it alone, was known in the Old Babylonian period, and that even the rubric ér-šà-ḫun-gá itself is an Old Babylonian term.[5]

1. J. Cooper, *Or*NS 42 (1973) 239ff.; S. Lieberman, *The Sumerian Loanwords in Old-Babylonian Akkadian*, Harvard Semitic Studies 22 (Missoula, 1977), pp. 18ff.; W. Heimpel, *AfO* 25 (1974-77) 171ff.; B. Foster, *Or*NS 51 (1982) 297ff.; B. Kienast, CRRAI 28 (*AfO* Beiheft 19, 1982) 105ff.

2. H. Hunger, *Babylonische und assyrische Kolophone*, AOAT 2 (Kevelaer, Neukirchen-Vluyn, 1968), pp. 10-11.

3. Hunger, *Kolophone*, pp. 1-3.

4. *Orality and Literacy* (London, 1982), pp. 112ff. Of course, there were some literate women, especially among the aristocracy or the cloistered (see W. W. Hallo in H. Tadmor and M. Weinfeld, *History, Historiography and Interpretation* [Jerusalem, 1984], p. 17 with notes), but literacy was by and large restricted to males.

5. "On the Early History of the Eršaḫunga Prayer," *JCS* 39 (1987) 37ff.

Another Sumerian Emesal text category, the *šuila*, remains undocumented prior to the first millennium, but the catalogue of *kalûtu* 4R 53+ lists several *šuila*s with incipits identical to listed *eršema*s, and the *eršema* is known from the Old Babylonian period. It is therefore possible that our few preserved *šuila*s from the first millennium may be older texts with a new rubric.[6] If a questionable occurrence in the reform texts of Uruʾinimgina is excluded,[7] the term šu-íl-la[8] first appears (but not as a rubric) in late Larsa royal hymns and inscriptions,[9] that is, later than the more common Sumerian terms for prayer and prayerful gestures,[10] and thus might be a loan translation of the common Akkadian *nīš qātim* and *qātam našûm*. If this is the case, it is somewhat ironic that *šuila* reappears in Akkadian as a Sumerian loanword, *šuʾillakku*, the designation for the most common type of Akkadian individual prayer.[11]

This Akkadian *šuʾillakku* has nothing whatever to do with the Sumerian Emesal *šuila* known from forty-seven incipits in the *kalûtu* catalogue and from a small number of preserved bilingual examples from first millennium Assyria and Babylonia.[12] These, like many of the more numerous Emesal *eršema*s,[13] are concerned with the appeasement on behalf of city, temple, and community of an angry god. This is *not* the theme of two recently published late Emesal *šuila*s from Uruk whose purpose is to insure ritual efficacy.[14] In both their cosmological introductions and their concern with ritual activity, these are not unlike yet another group of texts designated *šuila* which are written in main-dialect Sumerian and utilized in *mīs pî* ceremonies; they therefore belong—as do the Akkadian *šuʾillakku*—to the exorcistic repertory (*āšipūtu*) rather than the liturgical repertory (*kalûtu*).[15]

The *šuila* to Marduk edited here, ur-sag urú ur$_{(4)}$-ur$_{(4)}$, is listed in column iii line 55 of the *kalûtu* catalogue, immediately after mu-lu é-a kur$_4$-ra-zu-ta, the Marduk *šuila* edited in *Iraq* 32 51ff.[16] Unlike the latter, the incipit of this *šuila* has a twin in iii 4, in the list of *ershema* incipits.[17] Manuscript A was discovered over fifteen years ago by Erle Leichty during his study of unpublished Neo-Babylonian tablets in the British Museum, and he kindly sent me his preliminary transliteration because he knew of my interest in the Sumerian *šuila*. I studied the tablet on a subsequent visit to the museum, and was able to identify the newly published CT 51

6. Cooper, *Iraq* 32 (1970) 52; J. Krecher, *Sumerische Kultlyrik* (Wiesbaden, 1966), p. 25 n. 38. The text presented in this article happens to be one of those *šuila*s with an incipit listed in the *eršemma* catalogue as well.

7. H. Steible and H. Behrens, *Die altsumerischen Bau- und Weihinschriften* (Wiesbaden, 1982), Ukg. 4 6:29 and 11:15 might be read: ninda šu-íl-la, "prayer (?) bread"; níg šu-íl-la, "prayer (?) stuff"; or níg-šu íl-la, "delivered possessions." Cf. Steible's commentary and Cooper, SARI 1, p. 73 n. 11.

8. The extension of íl is usually -la in OB and earlier texts; -lá is a later phenomenon.

9. See Steible, *Rimsin, Mein König* (Wiesbaden, 1975), pp. 67 and 98.

10. A. Falkenstein, RlA 3 156f.

11. See W. Mayer, *Untersuchungen zur Formensprache der babylonischen "Gebetsbeschwörungen,"* Studia Pohl series maior 5 (1976).

12. See the examples enumerated in *Iraq* 32 (1970) 51ff. with additions of Mayer, *Or*NS 47 (1978) 442.

13. M. Cohen, *Sumerian Hymnology: The Eršemma* (*HUCA* suppl. 2, 1981).

14. Mayer, *Or*NS 47 (1978) 431ff.

15. *Iraq* 32 (1970) 51 n. 2.

16. See the corrections of R. Borger, *ZA* 66 (1976) 278f. Note especially that he correctly reads ka-laḫ and kal-ḫa for the KA.GA and É.ḪA of the Nimrud copy. Borger has also joined a small piece to K.3018, a partial duplicate to the text which I mentioned in *Iraq* 32 (1970) 54ff. The join fills out the list of divine names and epithets, but adds nothing new. CT 51 218 is a Ninevite manuscript whose reverse duplicates the beginnings of lines 37-39, with the name of Sinsharishkun, as in the Nimrud version of the prayer, but I am unable to match the few signs on the obverse with any exact sequence of the known text. Line 37, the last line in the text proper before the prayer for the king, is also the last line of the Sin *šuila* (Å. Sjöberg, *Der Mondgott Nanna-Suen in der sumerische Überlieferung*, I. [Stockholm, 1960], pp. 166ff.), but the obverse of CT 51 218 doesn't match any of the lines of the Sin text either. Most probably then, CT 51 218 is yet another, otherwise unattested, *šuila* with the same last line and an appended prayer for the reigning monarch.

17. Eršemma No. 37 in Cohen, *Sumerian Hymnology*, p. 9.

105 (B), also Neo-Babylonian, as a duplicate, to which Irving Finkel joined BM 35731 in 1980.[18] The fragment KAR 310 (C) preserves only a portion of the list of epithets of Marduk, making it impossible to determine whether it really belongs to this composition, as it well may.

STRUCTURE AND CONTENTS

The *šuila* edited below follows the pattern outlined by Mayer[19]: invocation of the deity with epithets followed by a prayer for city and temple and the appeasement of the deity. But it does not use the characteristic phraseology cited by Mayer, and does not exhort other deities to seek to calm Marduk. And unlike the other known Sumerian *šuila*s, it seeks vengeance against those who have brought destruction to the god's city and temple.

The text is divided into two parts. The first, lines 1-15, consists of epithets and names of Marduk, including, as is common in Emesal hymns and prayers, epithets linking him to the cities and temples of his father Ea and son Nabû, as well as to his own. The second and third epithets in the first line are used alternately as refrains after each new name and/or epithet introduced in succeeding lines; that is, urú ur$_{(4)}$-ur$_{(4)}$ is the refrain in even numbered lines, and kuš$_7$-su ki-bal-a the refrain in odd numbered lines.[20] The second part, lines 16-14′, continues the god's praise without the refrain, and then, beginning at least with line 1′ but probably before, urges vengeance on the god's enemies and the appeasement of his anger toward city and temple, which should be restored and rebuilt. This section is filled with typical repetition and parallelism, lexical and morphological, and is run through, at least from line 1′ on, with the usually chiastic repetition of the pair urú, "city," and é, "temple," (urú/é—é/urú etc.).

The names and epithets of Marduk will soon be treated exhaustively by W. G. Lambert, and the vocabulary of first millennium Emesal compositions is now relatively accessible through the dictionaries. The apparent increased attention being paid to these compositions should lead to the thorough semantic, ideological, and structural studies they deserve. This new Marduk *šuila* is offered here as data for ongoing and future studies, and comments will be made only on the difficult or the unusual.

List of Manuscripts

A	BM 59569 (82-7-14, 3979)	p. 91	1-21, 1′-14′
B	BM 34813 (CT 51 105) + BM 35731	pp. 92-93	1-16, 6′-14′
C	VAT 11691 (KAR 310 = 337a)	p. 93	5-10

18. Finkel also read the first draft of this article, made some valuable suggestions, and recollated the tablets. The unpublished texts and photos in this study are used courtesy of the Trustees of the British Museum.

19. *Or*NS 47 (1978) 442f.

20. This conforms to none of the patterns listed by Cohen, *Sumerian Hymnology*, p. 27f.

Transliteration

superscript: [*ina ama*]*t* ^{d}EN *u* ^{d}GAŠAN-*já liš-lim*[21]

1 [ur-s]ag urú ur-ur[22] ⌜kuš$_7$-su⌝ [ki-bal-a]
[*q*]*ar-ra-du a-bu-bu a-ši-šu sa-p*[*i-in* KUR *nu-kúr-ti*]

2 [u]r-sag ^{d}asal-lú-ḫi urú ur-[ur]
qar-ra-du ^{d}*marduk* *a-bu-bu a-*[*ši-šu*]

3 ur-sag ^{d}asal-alim-nun-na kuš$_7$-su ki-ba[l-a]
⌜*qar-ra-*⌝*du* ^{d}MIN *sa-pi-*⌜*in* KUR⌝ *n*[*u-kúr-ti*]

4 ^{d}marduk šita$_2$ sag-⌜gi$_4$⌝-a⌝ urú
⌜^{d}⌝MIN *kak-ku*[23] ⌜*la*⌝ *m*[*a-ḫ*]*ar* MIN

5 umun ^{d}en-bi-lu-lu ⌜kuš$_7$-⌝
⌜*be*⌝*-lum*[24] ^{d}MIN[25] MIN

6 ⌜^{d}⌝tu-tu umun na-ám-ti-la urú
⌜^{d}⌝MIN *be-el*[26] *ba-la-ṭu* MIN

7 ⌜^{d}⌝šà-zu umun šà-ab[27] sù-ud[28]-da kuš$_7$-
⌜^{d}⌝MIN *be-lum šá lìb-ba-a*[29]*-šú ru-ú-qa*[30] MIN

8 umun ^{d}sirsir[31] urú[32]
⌜*be-lum*⌝ ^{d}MIN MIN

9 umun [kur$^{?}$ a$^{?}$]-ab-ba[33] kuš$_7$-[34]
be-el[35] *šá-di-i*[36] *u ta-ma-tim*[37] MIN[38]

10 dumu-sag urú-zé-eb-ba^{ki}[39] urú
ma-ri reš-tu-ú šá eri$_4$*-du*$_{10}$ MIN

11 umun A.ḪA^{ki} kuš$_7$-
be-el[40] *ku-mar* MIN

12 umun TIN.TIR^{ki} urú
be-⌜*el*⌝ *ba-ab-ì-lí* MIN

13 ⌜umun é-sag-⌝íl-la kuš$_7$-
⌜*be-el* É.MIN⌝ MIN

14 umun é-zi-[d]a urú
be-el É.⌜MIN⌝ MIN

21. So the copy of B. The tablet is now broken up to ^{d}GAŠAN-*já liš-lim*, which itself is only poorly preserved. Finkel thinks the line might also have been on the destroyed upper left-hand corner of A.
22. So B, followed by erasure. A: [u]r$_4$-⌜ur$_4$⌝.
23. So B; A: ŠITA$_2$.
24. So A B; C: -*lu*.
25. So B; A broken; C: ^{d}en-b[i-lu-lu].
26. So A C; B: -*lum*.
27. So B; A broken; C: -ám.
28. So B; A broken; C omits.
29. So B; A broken, C: ŠÀ-.
30. So B and probably A; C: -⌜*qu*⌝.
31. So AB; C: $\left[{}^{S}_{d\,S}\right]^{IR}_{IR}$.AB.
32. So B; A broken; C: GIŠGAL followed by ur$_4$-ur$_4$ [:], and continuing with the Akkadian translation on same line.
33. So B, though hardly room to restore two signs; A: ⌜ab$^{?}$⌝-kur-r[a]; C: [ ]x-ab ([kur-r]a-ab or [kur]-⌜a⌝-ab possible).
34. So B; A broken; C adds -s[u].
35. So A; B: [*be*]-*lum*; C broken
36. So B C; A: KUR-*ú*.
37. So B; A broken; C: *tam-ti*.
38. So B; A broken; C: *sa-*[*pi-in*].
39. So B; A broken; C omits -ba.
40. So A; B: -*lum*.

15 umun é-maḫ-⌜ti-la⌝ kuš$_7$-
be-el ⌜É.MIN⌝ MIN

16 a x[ ]x [ ] ⌜x x su x x (x)⌝[41]
ana$^{?}$[ ]

17 gal-a[n$^{?}$-zu$^{?}$]
⌜x⌝[ ]

18 á-ka[l$^{?!}$]
i-di da[*n*$^{?!}$-]

19 še-er-m[a-al]
e-tel x[ ]

20 kur ki-ba[l]
KUR *nu-*[*kúr-ti*]

21 ^{d}⌜gilim$^{?}$⌝[ ]
[^{d}MI]N$^{?}$ *a-*[ ]

(gap of at most 2 lines from A obv. end to A rev. beginning)

1′ ⌜mu⌝-lu urú-zu ⌜ab-ḫul⌝-[la(x)] x-gim b[a-][42]
ana šá URU-*ka ú-šal-pi-tu ki-i x*[ ]

2′ mu-lu é-zu an-pel-lá-aš ta-aš m[i-ni-in]-gi
ana ša É-ka ú-qal-li-lu$_4$ *mi-na tuš-ḫa-ri-ir-šu*

3′ é-zi é-zu-gim rib-ba me-e ma-ra-an-dù-a
É ki-nu šá ki-ma É-ka šu-tu-qu e-ka-a-⌜*am*⌝ *i-ba-áš*$^{?}$*-ši-ka*

4′ urú-zi urú-zu-gim rib-ba me-e ma-ra-ma-ma
URU *ki-nu šá ki-ma* URU-*ka šu-tu-qu e-ka-a-am i-ba-áš-ši-ka*

5′ mu-lu sag a-ra-an-gíd-da á-zu la-ba-ra-è
šá i$^{?}$*-i-ru-ka ina i-di-ka a-a ú-ṣi*

6′ mu-lu sag a-ra-an-mar-ra-aš ki-za nam-ba-an-tùm[43]
šá i-ḫi-šu-ka it-ti-ka a-a it-bal

7′ é-bi urú-bi du$_6$-du$_6$-da-aš un-bi líl-lá-aš ù-ba-e-mar[44]
É-su u URU-*šu ana ti-li ni-ši-šu ana za-qí-qí te-er*[45]

8′ šu urú-za ù-bi-gi ka-nag-gá u$_6$ ì-e-a[46]
gi-mil-li URU-*ka ter-ma ma-a-tu*[47] *li-mur*

9′ šu é-za ù-bi-gi ka-nag-gá u$_6$ dè-è-a[48]
⌜*gi*⌝*-mil-li É-ka ter-ma ma-a-tu li-ib-ri*

10′ na-ám-maḫ ár-re-za[49] kur-kur-ra dè-en-zu-zu
na-ar-bi ta-na-at-ti-ka[50] KUR.MEŠ[51] *lil-ma-da*

41. Up to half brackets preserved in A only; from there on, B only. A has notation PAP in left margin.
42. Notation PAP in left margin.
43. So A; B: t]úm$^{?}$-ma$^{?}$.
44. So A; traces at end of line in B differ, concluding with -en.
45. So A; traces at end of B differ.
46. So A; B ends: d]è-e (my reading, doubted by Finkel).
47. So A; B: -*ta*.
48. So A; B ends: ⌜ka⌝-[nag] ú ⌜dè⌝-e.
49. So A; B: ár-r]e-zu.
50. So A; B: *ta-nit-*⌜*ti-ka*⌝.
51. So A; B: [*ma-ta*]-⌜*a-ti*⌝.

11′ in-di-ti na-ám-gìr-zu un-gé an-si-il-si-il-e
tal-lak-ti ga-ás-ru-ti-ka ni-šu[52] *lid-lu*[53]*-lu*

12′ é dù-a urú dù-a ka-nag ki-bé gi_4-a
bi-ta e-pe-šá[54] URU *e-pe-šá*[55] *ma-a-ta*[56] *ana aš*[57]*-ri-šá tur-ru*

13′ ḫun-gá ní te-na-ab[58] ur_5 $ša_6$-ga ša-ra-ma-ma
[n]u-uḫ šup-ši-iḫ ṭú-ub[59] *ka-bat-ti liš-šá-kin-ka*

14′ ⌜a⌝é-a é-a[60] è en-na u_4 en-na-aš
⌜a⌝-ḫu-lap É É *ḫi-iṭ*[61] *a-di ki-i ma-ṣi* u_4*-mi*

(subscript) [š]u-íl-lá ^{d}marduk-kam

(colophon) (A only):
[*ki-i*] *pi-i ṭup-pi šá gaba-ri ṣir-pí* BABBAR-*ú šaṭ-ru*
[*šá-ṭ*]*i-ir-ma ba-ri-im* IM.GÍD.DA ^{md}*nabû*-DU.NUMUN
[ŠU x-]x-^{d}*marduk* DUMU ^{m}*mi-ṣir-a-a* LÚ.GALA ^{d}*mar*[*duk*]

Translation

(superscript) At the command of Bēl and Bēltiya, may it (the tablet) be error-free!

1 Warrior, devastating deluge, destroyer of hostile lands,
2 Warrior Asalluḫi/Marduk, devastating deluge,
3 Warrior salalimnuna, destroyer of hostile lands,
4 Marduk, irresistable weapon, (devastating) deluge,
5 Lord Enbilulu, destroyer (of hostile lands,)
6 Tutu, Lord of Life, (devastating) deluge,
7 Shazu, whose thoughts are remote, destroyer (of hostile lands,)
8 Lord Sirsir, (devastating) deluge,
9 Lord of the mountains and seas, destroyer (of hostile lands,)
10 First-born of Eridu, (devastating) deluge,
11 Lord of Kumar, destroyer (of hostile lands,)
12 Lord of Babylon, (devastating) deluge,
13 Lord of Esagil, destroyer (of hostile lands,)
14 Lord of Ezida, (devastating) deluge,
15 Lord of Emaḫtila, destroyer (of hostile lands,)

52. So A; B: *ni-ši*.
53. So A; B: *-lul-*.
54. So A; B: *-šú*.
55. So A; B: *-šú*.
56. So A; B: *-ti*.
57. So A; trace in B differs.
58. So A; B: te-en-na-ab.
59. So A; B: *ṭu-u*[*b*].
60. So A; B omits -a.
61. So A; B: *ḫi-i-iṭ*

16 . . .
17 Wise one, . . .,
18 Mighty . . .,
19 Noble . . .,
20 The hostile foreign lands . . .,
21 Gilim? . . .

(gap of at most 2 lines)

1′ Toward him who has desecrated your city, like . . .
2′ Toward him who has defiled your temple, why have you remained silent?
3′ Where will a proper temple as excellent as your temple ever be built[62] for you?
4′ Where will a proper city as excellent as your city ever be established[63] for you?
5′ May he who opposed you never escape your grasp!
6′ May he who confronted you never plunder with your consent!?
7′ Turn his temples and cities to ruins, his people to ghosts!
8′ Avenge your city so that the nation might see it!
9′ Avenge your temple so that the nation might view it!
10′ May all the foreign lands apprehend the magnitude of your praise!
11′ May the people laud the ways of your power!
12′ To build the temple, to build the city, to restore the nation,
13′ Calm down! Relax! Let your mood become pleasant!
14′ Pity the temple! Regard the temple! For how long a time!

(subscript) A *šuila* of Marduk

(colophon) Written and collated according
to a tablet which is written from a
whitish baked copy.
One-column tablet belonging to Nabû-mukīn-zēri.
Product of X-x-Marduk, descendant of
Mišrāja, liturgist of Marduk.

Commentary

Line 9: The epithet is unusual. Compare BA 10/1 no. 16:4f. umun kur-ra a-ab-ba = *be-el* KUR-*i u ta-am-ti*. Finkel suggests that B might be restored [gú]-ab-ba, with the Akkadian a mistranslation.

62. For the Akkadian verb, see Comments.
63. For the Akkadian verb, see Comments.

Line 11: For Kumar/Ku'ara here, see the citation of this line by Gurney, *Iraq* 36 (1974) 49; Heimpel, RlA s.v. Ku'ara; and M. J. Geller, *Forerunners to UDUG-ḪUL: Sumerian Exorcistic Incantations*, FAOS 12 (Stuttgart, 1985), p. 13.

Line 16: The marginal notation PAP in A here and in l. 1′ (pointed out by Finkel) has been discussed by Lambert in G. van Driel *et al.* (eds.), *Zikir Šumim* (Leiden, 1982), p. 216. It presumably marks an error in the text.

Line 21: Finkel suggests reading ^{d}GIŠ.N[U$_x$.GAL] in the Sumerian line.

Lines 3′ f.: Both lines are translated according to the Sumerian. Where we would expect *banû* "build" in 3′ and *šakānu* "establish" in 4′, the Akkadian gives us in both instances (for two different Sumerian verbs) *bašû* "exist."

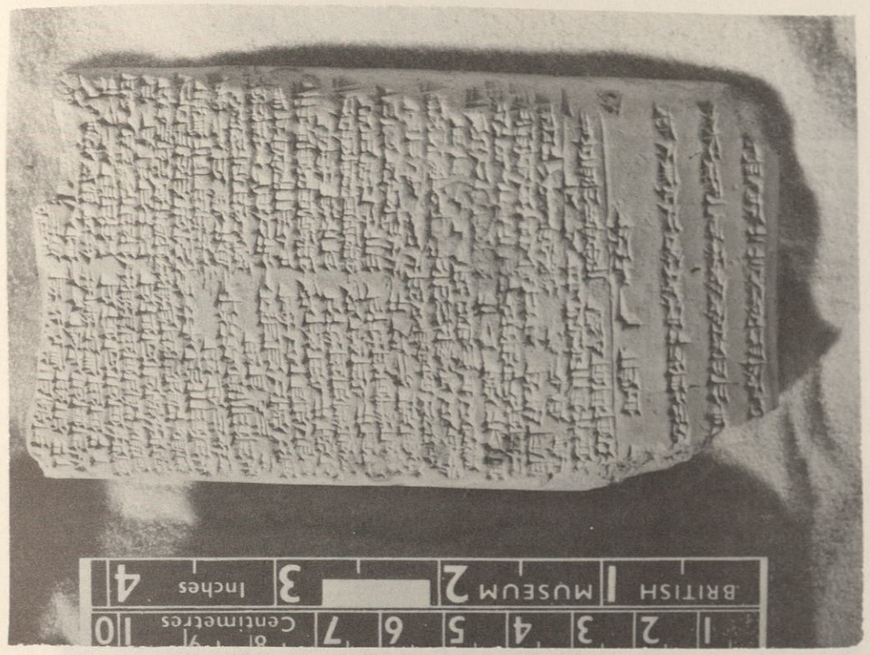
Line 8′: The Sumerian of A presents the verbal contrast u_6—è vs. u_6—e to match the different verbs of the Akkadian. B, however, seems to have had $^{\bullet}u_6$—e for both. The situation is thus the reverse of the one in 3′f., where the same Akkadian verb translates different Sumerian verbs.

Line 14′: The meaning is "how long will it be until you take pity on your temple and rebuild it?"

Colophon: Baked tablets (*ṣirpu*) are otherwise characterized in colophons only as reddish (Hunger, *Kolophone* s.v.). Incorrect *ba-ri-im* for *ba-ri* is occasionally attested (Hunger, *Kolophone*). For IM.GÍD.DA, See Finkelstein, *RA* 63 (1969) 24. For the very different colophon of a Nabû-mukīn-zēri from Babylon (where our manuscript A is very probably from, also), see A. Cavigneaux, *Textes scolaires du temple de Nabû ša Ḫarê* (Texts from Babylon, 1) (Baghdad, 1981), p. 41. I know of no descendant of Miṣirāja whose name ends with the element "Marduk."

B. M. 59569

rev.



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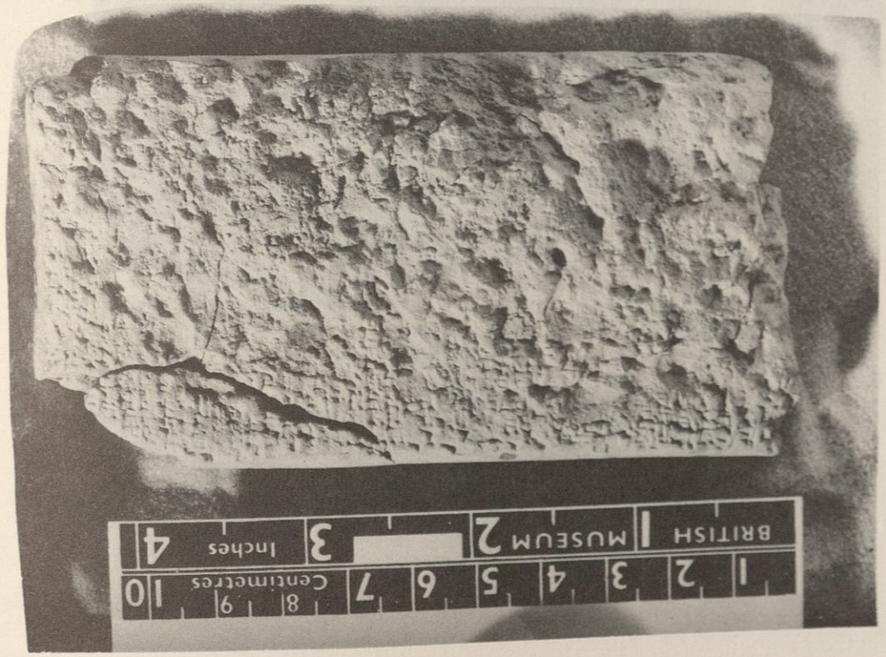

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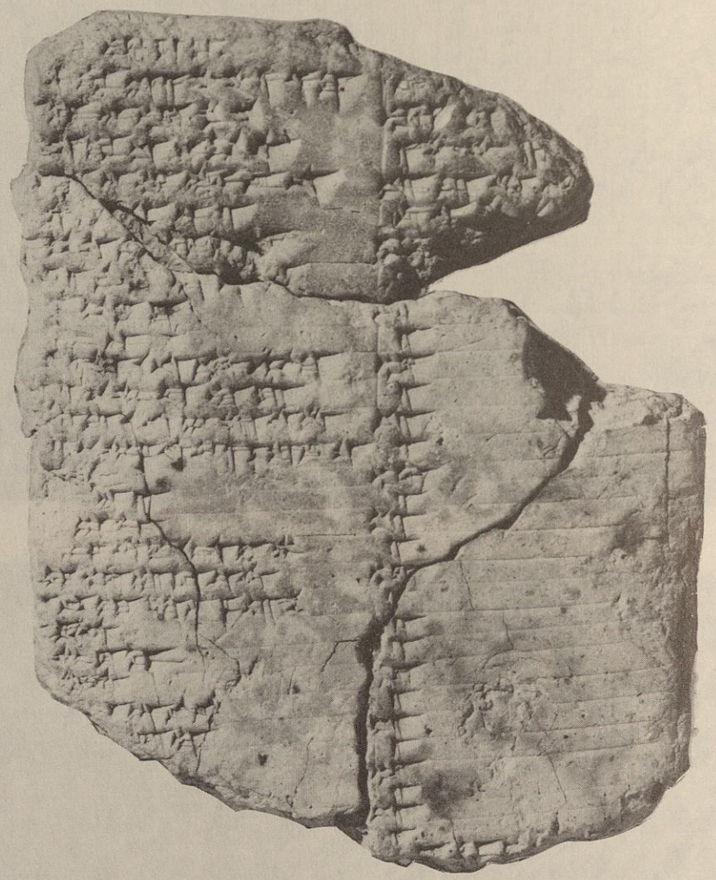

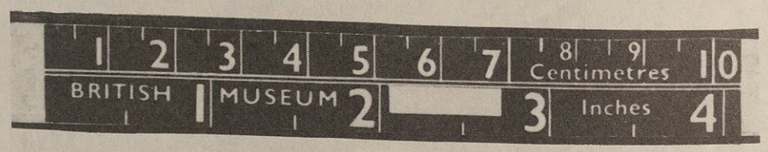

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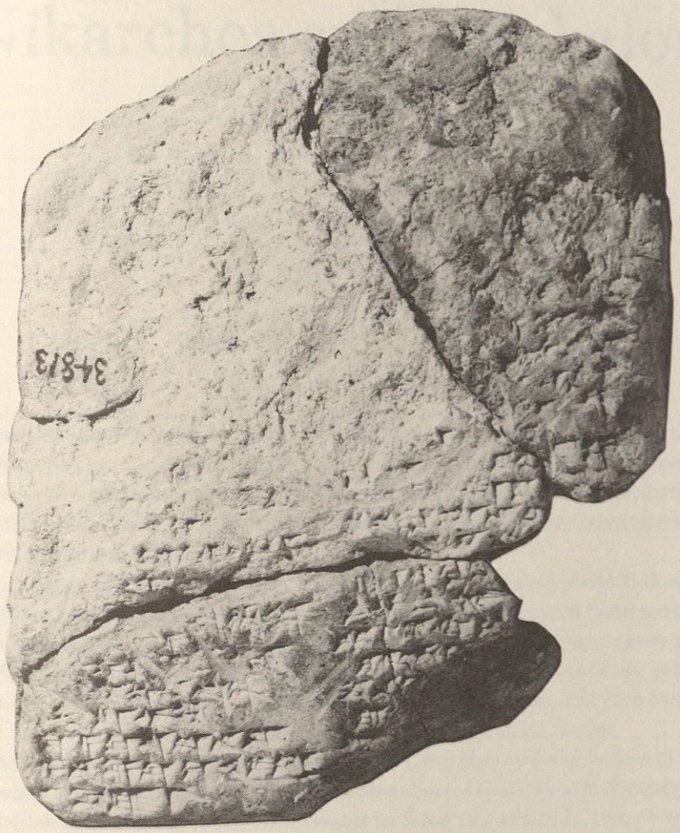
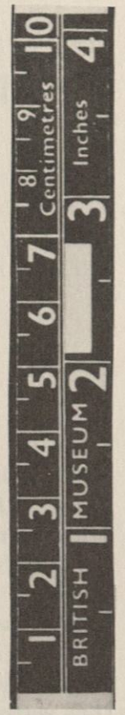




VAT 11691

Nikarchos and Kephalon

L. Timothy Doty

Warka, the site of ancient Uruk, has yielded quantities of cuneiform texts dating to the Seleucid Period. Abraham Sachs made an immense contribution to the study of this material, especially the various kinds of astronomical texts. And Abe Sachs brought to his work on this material a broad perspective based on a comprehensive knowledge of cuneiform literature and the sweep of ancient Mesopotamian history.

It was my privilege as a graduate student to have Abe Sachs on my dissertation committee. I remember with great fondness afternoons spent at the Sachs' home in Jamestown going over drafts of chapters. Abe was always both kind and thorough. He taught me a great deal and saved me from much embarrassment. It was a saying among graduate students of my generation, and I am sure among Abe's colleagues as well, "If no one can figure it out, ask Abe Sachs." It is with gratitude that I offer this essay in memory of my teacher, Abraham Sachs.

Although the total number of tablets from Seleucid Uruk is considerable, few of them provide information relating to the government and administration of that city in Hellenistic times. Of the information which is available, much of it relates to three city officials, two of whom bore the name Anu-uballiṭ.

The earlier of these Anu-uballiṭs is known from a building inscription dated 68 SE (244 BCE). This text, YOS 1 52, describes the construction, or reconstruction, and dedication of the Rēš, the huge temple of Anu and Antu in Uruk.[1] The inscription reads, in part, as follows:[2]

1. On the topography and temples of Seleucid Uruk, see Adam Falkenstein, *Topographie von Uruk, I. Teil: Uruk zur Seleukidenzeit*, Ausgrabungen der Deutschen Forschungsgemeinschaft in Uruk-Warka 3 (Leipzig, 1941); and Ernst Heinrich, *Die Tempel und Heiligtümer im alten Mesopotamien: Typologie, Morphologie und Geschichte*, Denkmäler antiker Architektur, Band 14 (Berlin: 1982), pp. 327-334 and illustrations 417-426. The Rēš temple in some form was already on the site prior to the building activity described in YOS 1 52. It is mentioned in a hymn, BRM 4 8, and a ritual, BRM 4 7, both dated 61 SE (251/250 BCE). See Falkenstein, *Topographie*, p. 8, and Heinrich, *Die Tempel*, p. 328. The remains of previous buildings on the site of the Seleucid temple have been described in UVB 16, pp. 13-22. So YOS 1 52 probably deals with a major reconstruction of a previously existing Rēš temple.

2. The text has been edited by A.T. Clay in YOS 1, pp. 81-84, and again by Falkenstein in *Topographie*, pp. 4-5. While another full edition here is not warranted, it should be noted that two signs were miscopied by Clay. These are the KÁ in KÁ.MAḪ in line 4 and the KÁ in KÁ. MAḪ at the beginning of line 7. In both cases Clay omitted the two

1) ^{iti}BÁR MU.68.KÁM ^{m}*si-lu-ku* LUGAL ^{md}60-DIN-*iṭ* DUMU *šá* ^{md}60-*ik-ṣur* A ^{m}*áḫ-*$^{?}$*-ú-tú*
2) ^{lú}GAR-*nu šá* UNUG^{ki} *šá* ^{m}*an-ti-*$^{?}$*-i-ku-su* LUGAL.KUR.KUR.MEŠ
3) ^{m}*ni-qí-qa-ar-qu-su* MU-*šú šá-nu-ú iš-kun-nu*
4) ^{é}*ri-eš* É ^{d}60 *ù an-tu*$_4$ . . .
5) *a-na bul-ṭu šá* ^{m}*an-ti-*$^{?}$*-i-ku-su u* ^{m}*si-lu-ku* LUGAL.MEŠ DÙ-*uš-ma ú-šak-lil*
16) ^{iti}BÁR U$_4$.8.KÁM ^{d}*a-nù ù an-tu*$_4$ KU$_4$-*ma*
17) *ina* É.NAM.EN.NA ^{é}*pa-pa-ḫi ina šub-ti-šú-nu*
18) *a-na da-ra-a-tú ú-šib-bi gi-nu-ú šat-tuk-ku*
19) *ki-ma maḫ-ri-im-ma ú-kin*^{in}*-ni qé-reb-šú*

"(I) Nisannu, year 68, Seleukos (being) king: Anu-uballiṭ, son of Anu-ikṣur, descendant of Aḫ'ûtu, the city administrator of Uruk—to whom Antiochos, king of the lands, gave his second name, Nikarchos—built and completed the Rēš, the temple of Anu and Antu. . . (15) for the sake of the lives of Antiochos and Seleukos, the kings. On the eighth of Nisannu he brought in Anu and Antu and caused them to reside in the sanctuary, their dwelling place forever. He established (regular) *ginû* and *šatukku* offerings in it (the Rēš) as in the past."

This text provides two important pieces of information about Anu-uballiṭ=Nikarchos. One is his title, *šaknu*.[3] This is a general term for an appointed official which, depending on the context, might be translated "foreman" or "governor."[4] In our context the term might best be translated "city administrator." While Nikarchos had the authority to carry out building activities on the central shrine of the city, and was eager to have it known that his Greek name had been conferred on him by Antiochos himself, we have no evidence that his authority extended beyond the city of Uruk. It is therefore unlikely that *šaknu* was the equivalent of either of the Greek titles *epistatēs* or *stratēgos*.[5]

The only other direct attestation we have of Nikarchos is in a real estate sale, YOS 20 46 (NCBT 1958),[6] in which he appears as a land owner in the property description, line 8. This tells us that he was a property owner, but adds nothing to our knowledge of his administrative role.

superimposed vertical wedges at the end of the sign. I want to thank Professor William W. Hallo, Curator of the Yale Babylonian Collection for permission to collate this inscription as well as other tablets in the Yale Babylonian Collection noted below.

3. The title is to be read ^{lú}GAR-*nu* rather than ^{lú}*šá-nu*, as Clay read it in YOS 1. The title ^{lú}*šanû* is written ^{lú}2-*û*. Unfortunately, Anu-uballiṭ = Nikarchos has been demoted to "second officer" in much of the secondary literature on Seleucid Uruk because of Clay's reading: for example, M. Rutten, *Contrats de l'èpoque séleucid conservés au Musée du Louvre = Babyloniaca* 15 (1935) 70; André Aymard, "Une ville de la Bablylonie Séleucid d'aprè les contrats cuneiformes," *Revue des études anciennes* 40 (1938) 33 n. 2; M. Rostovtzeff, *Social and Economic History of the Hellenistic World* (London: 1941), pp. 435 and 514; and Maurice Meuleau in *Der Hellenismus und der Aufstieg Roms*, Fischer Weltgeschichte 6 (Frankfurt am Main: 1965), p. 284.

4. See on the title in various contexts: Richard A. Henshaw, "The Office of *šaknu* in Neo-Assyrian Times. I and II," *JAOS* 87 (1967) 517-525 and *JAOS* 88 (1968) 461-483; J.V. Kinnier Wilson, *The Nimrud Wine Lists*, CTN I (London: 1972), pp. 12-14; J.A. Brinkman, *A Political History of Post-Kassite Babylonia 1158-722 B.C.*, AnOr 43 (Rome: 1968), pp. 296-298; Ran Zadok, "The Nippur Region during the Late Assyrian, Chaldaean and Achaemenian Periods, chiefly according to written sources," *Israel Oriental Studies* 8 (1978) 275-276; and Matthew W. Stolper, *Entrepreneurs and Empire: The Murašû Archive, the Murašû Firm, and Persian Rule in Babylonia* (Nederlands Historisch-Archaeologisch Instituut te Istanbul: 1985), pp. 82-88.

5. Against my earlier impression in L.T. Doty, "Cuneiform Archives from Hellenistic Uruk," = Doty, *Archives* (Unpub. Ph.D diss. Yale University, 1977), p. 24.

6. Unpublished text in the Yale Babylonian Collection. This text, along with 99 other Seleucid texts from Uruk in the Newell Collection of Babylonian Tablets, the Morgan Library Collection and the Yale Babylonian Collection, will be published in my forthcoming volume 20 of the Yale Oriental Series: Babylonian Texts.

The other Anu-uballiṭ is also known to us from building inscriptions. An inscription on several bricks found in the central part of the Rēš temple[7] informs us that, in year 110 SE (202 BCE), an Anu-uballiṭ repaired and remodeled the cellas of Anu and Antu in the Rēš temple. The inscription opens as follows: (1) ^{md}60-DIN-*iṭ šá* MU-*šú* (2) *šá-nu-ú* ^{m}*qí-ip-lu-un-nu* (3) A *šá* ^{md}60-DIN-*su*-E ^{lú}GAL (4) ^{lú}SAG URU *šá* UNUG^{ki}. . . "Anu-uballiṭ, whose second name is Kephalōn, son of Anu-balāssu-iqbi, overseer of the *ša rēši* people of the city of Uruk. . ." The text goes on to dedicate the repairs and remodeling (lines 10-11) *a-na muḫ-ḫi bul-ṭu šá* ^{m}*an-ti-*$^{?}$*-i-ku-su* LUGAL (KUR.KUR) *be-el-ia*, "for the sake of the life of Antiochos, king (of the lands), my lord." In addition, Kephalōn seems to trace the origins of the Rēš temple into the mythical past, back to the ancient *apkallu* Oannes (u$_4$-^{d}an).[8]

Anu-uballiṭ=Kephalōn is also known from another building inscription, this one from the Irigal temple, the temple of Ištar and Nanâ in Seleucid Uruk.[9] This inscription is not in cuneiform but in Aramaic characters on glazed brick. As reconstructed by R. A. Bowman,[10] it reads, "Anu-uballiṭ, whose other name (is) Kephalōn." This is repeated, and that is all there is to the inscription. Since it was found on the back wall of the main cella of the Irigal, it is presumed that Anu-uballiṭ= Kephalōn was also responsible for building activity in this temple.

This presumption is supported by a very unusual text published by Gilbert McEwan.[11] This is a request by Anu-uballiṭ=Kephalōn for an oracle by augury on the occasion of repairs to the statue of Ištar.[12] The date on this tablet, if there was any, is now lost. Interestingly, the text appears to note yet a third name by which Anu-uballiṭ=Kephalōn was known. Lines 4-6 read, in part, ^{md}60-DIN-*iṭ šá* MU-*šú* [*šá-nu*]-*ú* ^{m}*qí-ip-lu-ú-nu šá ina* KA UN.MEŠ *x-x-tú-u i-qab-bu-ú*, "Anu-uballiṭ, whose second name is Kephalōn, whom they commonly call [. . .]-tû."

Finally, Kephalōn appears in YOS 20 54 (NCBT 1962) as the husband of Antiochis, a party to the contract, with his title partly preserved in lines 9-10: ^{md}60-DIN-*iṭ šá* MU-*šú* 2-*ú* ^{m}*qí-ip-lu-ú-nu* ^{lú}GAL ^{lú}S[AG. . .A *šá*] ^{md}60-DIN-*su*-E A ^{m}*áḫ-*$^{?}$*-ú-tú*.

These four texts together point to the important position Kephalōn held in the city of Uruk. His building activities extended to both major temples of hellenistic Uruk, and he was in a position to supervise repairs to an important cult statue. However, the exact position of Kephalōn in the city administration is not as clear as that of Nikarchos, the *šaknu*. Kephalōn's title is *rab ša rēš āli ša Uruk*, "overseer of the *ša rēši* people of the city of Uruk." The term *ša rēši* denotes either a class of service personnel attached to a temple or household, or persons trained in specific skills. Such persons could hold high administrative posts, depending on the household in which they served (e.g. *ša rēš šarri*), and some may have been eunuchs, depending on their particular duties.[13] Kephalōn's title describes him as the overseer of this class of personnel at Uruk.

7. Published in WVDOG 51, plate 108, and edited in part on p. 41. Falkenstein presents as full an edition as is possible given the condition of the texts, in *Topographie*, pp. 6-7.

8. J. van Dijk, UVB 18 p. 47, suggests reading lines 6-7 of the inscription ^{é}*rēš ša ina maḫri*(?) u$_4$-^{d}an-[a-d]a-p[à]?! *ipušu*, "das rēš-Heiligtum, das in frühen Zeiten der U'an[adapa] gebaut hatte." However, van Dijk mistakenly attributes the inscription to Nikarchos rather than Kephalōn.

9. See Falkenstein, *Topographie*, pp. 30-39, and Heinrich, *Die Tempel*, pp. 331-333.

10. "Anu-uballiṭ-Kefalon," *AJSL* 56 (1939) 231-233.

11. "A Seleucid Augural Request," ZA 70 (1980) 49-69.

12. One wonders whether this statue might be the one whose remains were excavated in the Südbau during the 1934/35 campaign. It is described in UVB 7, p. 37, and pictured on plate 39a. Falkenstein, *Topographie*, p. 30, notes: "Trotz des fragmentarischen Zustands der Figur, die annähernd Lebensgösse besass, lässt sich so viel mit Sicherheit erkennen, dass es sich um die Statue einer weiblichen Gottheit handelt."

13. See A. Leo Oppenheim, "A Note on *ša rēši*," in *The Gaster Festschrift = JANES* 4 (1973) 325-334.

Additional light is thrown on Kephalōn and his position in the administration of Uruk when we turn to his father, Anu-balāssu-iqbi. The latter is attested in two documents. One of these, TCL 6 1, is a tablet of liver omens of which Anu-balāssu-iqbi was the owner (but not the scribe).[14] His title is given as ^{lú}GAL ^{lú}SAG URU-*a šá* UNUG^{ki} (reverse line 57). The table is dated 4.II.91 SE (221 BCE). The other text is an unusual contract—actually two contracts on one tablet. The principals are the same in both. The first is a lease of land belonging to the temple and the second is a conditional purchase of temple land. In both transactions Anu-balāssu-iqbi acts on behalf of the temple, which owns the arable land (*zēru*) in question.[15] Here he has the title *paqdu ša bīt ilāni* (lines 23 and 39), "manager of the temple (i.e., the Rēš temple)." This document is dated less than two months later than TCL 6 1, in 3[+].III?.91 SE. Thus it is almost certain that Anu-balāssu-iqbi held two offices simultaneously, or that the two titles were used interchangably.

G. Kh. Sarkisian has collected the evidence for the use of these titles in Seleucid Uruk.[16] He concludes that the titles *paqdu ša bīt ilāni* and *rab ša rēš āli ša Uruk* designated not two separate administrative offices but were two different, originally separate, designations of the same office.[17] This is supported by the appearance of the hybrid title *rab ša rēš āli ša bīt ilāni* in BRM 2 47 (line 29), dated 157 SE, in a context exactly parallel to *paqdu ša bīt ilāni* in *VDI* 1955/4 no. 8 (line 22).[18]

Sarkisian does not try to bring Nikarchos's title, *šaknu,* into relationship with *rab ša rēš āli/paqdu,* the title born by Anu-balāssu-iqbi and his son Kephalōn. However, we might understand the relationship by analogy with the Persian period. In the evidence collected by Matthew Stolper relating to the Murašû archive,[19] the *šaknu* serves as foreman of *ḫaṭru* associations. The *šaknu* might be assisted by persons called *šanû* (deputy), *aḫu* (brother, assistant) or *paqdu* (bailiff, manager). The titles of these assistants appear to be interchangeable (as do *rab ša rēš āli* and *paqdu* in our texts) and occasionally a person attested as an assistant will rise to foreman.[20] If the analogy holds for the later period and different area, our Nikarchos would, as *šaknu* appointed by the king, have been an official of higher authority, having assistants with the title *rab ša rēš āli* or *paqdu*. That Nikarchos and Anu-balāssu-iqbi may well have stood in this sort of relationship is suggested by the fact that Anu-balāssu-iqbi is first attested in 91 SE (TCL 6 1) while Nikarchos is still active in 98 SE (YOS 20 46) where he appears as a land owner but no title is given.

14. The colophon is edited in Hermann Hunger, *Babylonische und assyrische Kolophone*, AOAT 2, no. 96.

15. Published by G. Kh. Sarkisian, "New Cuneiform Texts from Uruk of Seleucid Period in the Staatliche Museen zu Berlin," *Forschungen und Berichte* 16 (1974) 15-76, as no. 1. (Texts from this article are cited as FB 1974 below.) See the detailed discussion on pp. 21-24 and in Sarkisian, "New Data Concerning City-owned Land in Seleucid Babylonia," *Drevnii Vostok* 1 (1973) 185-193 and 238-239 (Russian with English summary).

16. "Zum Problem des Herrschertitels in Uruk der Seleukidenzeit," *Societies and Languages of the Ancient Near East: Studies in Honor of I.M. Diakonoff* (Warminster: 1982), pp. 333-335.

17. Bernd Funck, *Uruk zur Seleukidenzeit*, Schriften zur Geschichte und Kultur des alten Orients 16 (Berlin: 1984), pp. 291-294, argues that Kephalōn's title was actually two titles: ^{lú}SAG *āli ša uruk*^{ki} which he translates "Haupt der Stadt Uruk" and takes as the equivalent of Nikarchos' title, *šaknu*; and ^{lú}GAL which he takes as the equivalent of Greek *stratēgos*. This is highly unlikely, however, in view of the well known reading of ^{lú}SAG as *ša rēši* and the equivalence of the titles *rab ša rēš āli* and *paqdu* in our texts as demonstrated by Sarkisian.

18. *VDI* 1955/4 designates the texts published in Sarkisian, "Private Contracts in Cuneiform from the Seleucid Period from the Hermitage Collection," *VDI* 1955/4, pp. 136-162 and plates 1-10 (in Russian).

19. *Entrepreneurs and Empire*, pp. 70-93 and especially pp. 82-88.

20. *Entrepreneurs and Empire*, pp. 82-83.

In the article in which R. A. Bowman successfully reconstructed the Aramaic inscription from the Irigal, he also collected the references to both Kephalōn and Nikarchos and members of their families from the archival texts and presented a family tree which included both men.[21] Texts which have become available since show that the two families must now be separated.[22] Figures 1 and 2 show my reconstructions of the family trees of Kephalōn and Nikarchos based on the published and unpublished texts available to me. Tables 1 and 2 list the documentation for each member of the Kephalōn and Nikarchos families by generation.

Beginning with the family of Kephalōn, one feature is evident at a glance. That is the large number of family members bearing Greek names. This is indicative of the process of hellenization at Uruk which seems to have begun in earnest under Antiochos III and gained momentum under Antiochos IV.[23]

The evidence for Anu-aḫ-ittannu of generation one has already been presented. He appears only in the patronymics of Anu-balāssu-iqbi or of his grandson, Anu-bēlšunu (VAS 15 42:11). The attestations of Anu-balāssu-iqbi of generation two have also been presented above. As manager of the temple/city, he appears as the representative of the temple in the lease and conditional sale of arable land to a certain Nidintu-Anu, son of Anu-balāssu-iqbi, a shepherd of the estate of Anu (^{lú}SIPA NÍG.GA ^{d}60: *FB* 16 [1974] no. 1:25 etc.).

The other two members of generation two are Diophantos,[24] the father of Antiochis, Kephalōn's wife; and Šamaš-ēṭir, the grandfather of Antu-banāt, who was the wife of a member of generation four of the Kephalōn family. Both are attested only in patronymics.

Of the children of Anu-balāssu-iqbi, some of the evidence for Anu-uballiṭ=Kephalōn has already been discussed above. In addition to those attestations, we also know of him from two archival texts in which he appears in property descriptions. In neither document is he a contracting party. In VAS 15 12 it is Kephalōn's slave who owns land bordering that being sold. Lines 5-6 read: . . . ^{m}*tat-tan-nu-*^{d}*na-na-a* ^{lú}ÌR *šá* ^{m}*qí-ip-lu-ú* DUMU *šá* ^{md}60-DIN-*su*-E . . The other land sale is A 3682[25] where Kephalōn owns property in the district of the Lugalgirra temple in Uruk: . . É ^{m}*qí-ip-lu-ú-na* A *šá* ^{md}60-DIN-*su*-E A ^{m}*áḫ-*$^{?}$*-ú-tú* (line 6). Otherwise, Anu-uballiṭ is attested only in patronymics or as the husband of his more business-minded wife, Antiochis.

Antiochis appears in three archival texts, all sales of allotmets (*isqu*), and in each case she is the buyer. VAS 15 7 is fragmentary and the date is lost. The allotment which Antiochis buys in this document is an *ērib-bītūtu* allotment[26] and the price is 5/6 mina 5 shekels of silver. YOS 20 54

21. See "Anu-uballiṭ," p. 243.

22. This was correctly observed by Sarkisian in his article on the Greeks at Uruk, "Greek Personal Names in Uruk and the Graeco-Babyloniaca Problem," *Drevnii Vostok* 2 (1976) 181-217 and 304-309 (Russian with English summary). Sarkisian presents family trees for each family: Nikarchos on p. 195 and Kephalōn on p. 201. However, that of Nikarchos presents some distortion due to the misreading of certain names. On p. 195, Ša-nādin-šum-^{d}Anu should be read ^{m}NÍG.SUM.MU-^{d}60 = Nidintu-Anu (as suggested in parentheses), and Nu-ur should be read ^{m}NU.TÉŠ = Lābāši. In addition, the branch Anu-uballiṭ = Nikarchos → Ina-ki-líl-^{d}Anu (sic)→ Ta-nit-tu$_4$-^{d}Anu → Nu-ur (sic) is based on a misreading of BRM 2 33:28, which reads: ^{lú}*mu-kin*$_7$ ^{m}NU.TÉŠ A *šá* ^{m}*ta-nit-tu*$_4$-^{d}60 ^{m}*ina-qí-bit-*^{d}60 A *šá* ^{m}*n*[*i-iq-ar*]-*qu-su* . . . There is no A šá between Tanittu-Anu and Ina-qibit-Anu (collated).

23. Sarkisian lays out the evidence for this in "Greek Personal Names," but draws more far-reaching conclusions from it than I believe are warranted.

24. He appears in YOS 20 54:15 and 21 (NCBT 1962), both broken. Line 15 reads: . . . ^{f}*an-ti-*$^{?}$*-i-ki-su* DUMU.MÍ *šá* ^{m}*di-*$^{?}$*-ú-p*[*a* . . .], and line 21 preserves only ^{m}*di-*[. . .]. The name is restored on the basis of the name Diophantos in other texts. Sarkisian, *Drevnii Vostok* 2 (1976) 196, has noted the evidence and the various spellings of the name, which confirm Bowman's original suggestion of the correct reading in "Anu-uballiṭ," p. 239 n. 33.

25. Unpublished tablet in the collection of the Oriental Institute, University of Chicago. This text, along with A 3678, A 3680, A 3682, A 3685, and A 3690, were used by Sarkisian in "Greek Personal Names." I would like to thank Professor John A. Brinkman for permission to cite these tablets and the Oriental Institute for supplying me with photographs of them.

26. On allotments in general and the *ērib-bītūtu* in particular during the Seleucid period, see Doty, *Archives*, pp. 119-122 and 124-126.

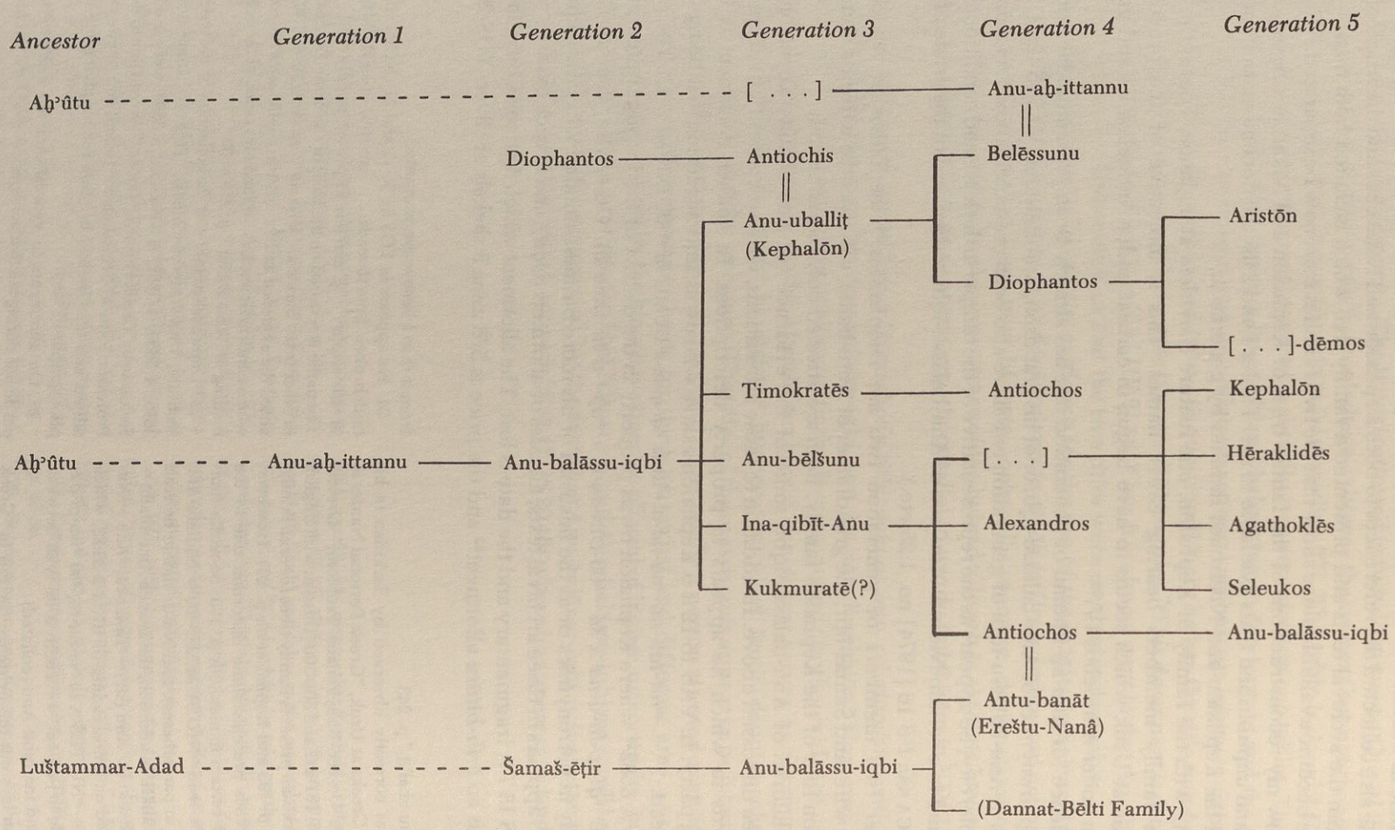


FIGURE 1: THE KEPHALŌN FAMILY

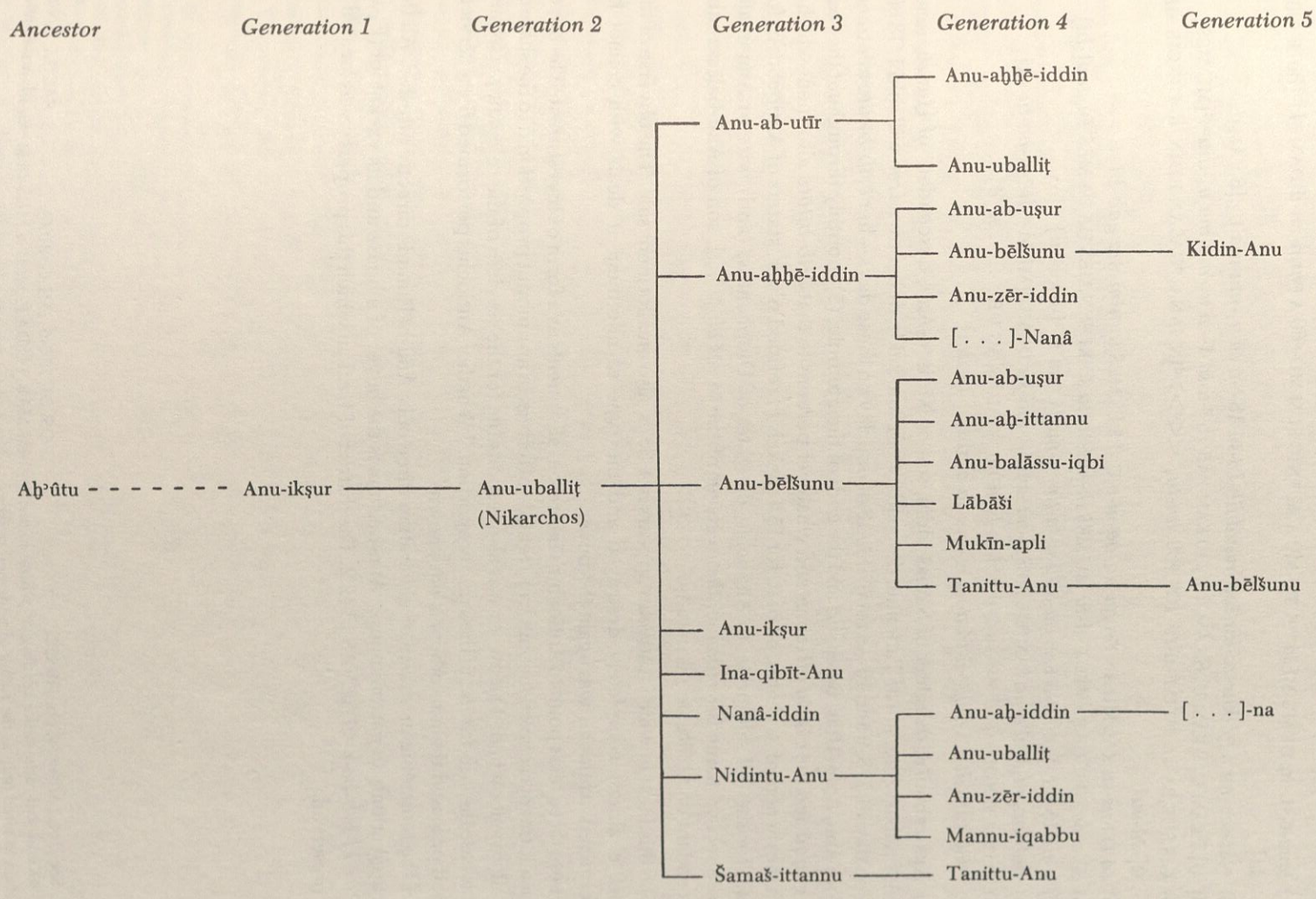


FIGURE 2: THE NIKARCHOS FAMILY

(NCBT 1962) is better preserved and is also interesting in that both the seller and the buyer, Antiochis, are women. It reads, in part, as follows:

1) [f]*ana*-GAL-*šú* DUMU.MÍ *šá* [md]UTU-MU A *šá* [m]NÍG.SUM.MU-[d]60 A [m]*ḫun-zu-ú* DAM [m]*la-*[*ba-ši-*[d]60 A *šá*]
2) [m]*tat-tan-nu* A [m]*é-kur-za-kir ina ḫu-ud lìb-bi-šú* 18-[ʾ]*-ú šá u₄-mu ina* U₄.[6.KÁM]
3) U₄.7.KÁM U₄.9.KÁM U₄.8.KÁM *ú* U₄.10.KÁM PAB 18-[ʾ]*-ú šá* 1-*en u₄-mu ina u₄-mu*[meš][MU.MEŠ]
4) GIŠ.ŠUB.BA-*šú* [lú]TU.É-*ú-tú* IGI [d]60 *an-tu₄* <<[d]>>[d]INNANA [d]GAŠAN.EDIN *ù* DINGIR.MEŠ É[-*šú-nu*]
5) *šá* ITI-*us-su* KAL MU.AN.NA *gu-uq-qa-ni-e* U₄.ÈŠ.ÈŠ.MEŠ *ù mim-ma gab-bi*
6) *šá a-na* GIŠ.ŠUB.BA [lú]TU.É-*ú-tú* MU.MEŠ *ik-kaš-ši-du šá* KI [lú]EN.MEŠ ḪA.LA.MEŠ-*šú gab*[-*bi*]
7) *a-na* 15 GÍN ½ KÙ.BABBAR *qa-lu-ú is-ta-tir-ra-nu šá* [m]*an-ti-*[ʾ][-*i-ku-su*]
8) *bab-ba-nu-ú-tú a-na* ŠÁM TIL.MEŠ *a-na* [f]*an-ti-*[ʾ]*-i-ki-su* DUMU.[MÍ *šá* [m]*di-*[ʾ]*-ú-pa-tu-su*]
9) DAM [md]60-DIN-*iṭ šá* MU-*šú* 2-*ú* [m]*qí-ip-lu-ú-nu* [lú]GAL [lú]S[AG URU . . . A *šá*]
10) [md]60-DIN-*su*-E A [m]*áḫ-*[ʾ]*-ú-tú a-na u₄-mu ṣa-a-tú tat*[-*ta-din*]

"(1) Ana-rabūtišu, daughter of Šamaš-iddin, son of Nidintu-Anu, descendant of Ḫunzû, (and) wife of Lābāši-Anu, son of Tattannu, descendant of Ekur-zakir, of her own free will sold 1/18 of a day on days 6, 7, 8, 9 and 10—a total of 1/18 of one day on those days—her *ērib-bītūtu* allotment before Anu, Antu, Ištar, Bēlet-ṣeri and the gods of their temple, (5) monthly throughout the year, the *guqqû* and the *eššešu* offerings and whatever pertains to that *ērib-bītūtu* allotment which is with the owners of its shares, all of it, for 15½ shekels of refined silver, staters of Antiochos of full value, for the full sale price, to Antiochis, daughter of Diophantos, (and) wife of Anu-uballiṭ whose second name is Kephalōn, the overseer of the *ša rēš āli* [. . .], son of Anu-balāssu-iqbi, descendant of Aḫʾûtu, in perpetuity."

The third text in which Antiochis appears is A 3678, also an allotment sale. The obverse of this tablet is almost completely destroyed and the type of allotment it dealt with cannot be determined. Antiochis was again the buyer.

These three texts point to Antiochis's interest in allotments as a form of investment. The buyer of an allotment received income from temple offerings in an amount proportional to the share of the allotment owned. The owner was also responsible for the services of the relevant personnel, in this case the *ērib-bītūtu*, in the same proportion.[27] Whether Antiochis performed these services herself or leased them to others is not known.

Of the remaining members of generation three only Anu-bēlšunu is directly attested. All the rest appear only in patronymics.[28] Anu-bēlšunu is the buyer of a house and its vacant lot (E_2-*su ép-šú u ki-šub-ba-a-šú*) in VAS 15 42:2. The district of Uruk in which this property was located is not preserved.

27. See Doty, *Archives*, pp. 119-122.

28. [m]*Ku-uk-mu-ra-te-e*, the reading of whose name is uncertain, is cited only as the father of unnamed persons owning land in the vicinity of the Irigal temple. The text is YOS 20 72:5-6 (MLC 2166): . . . UŠ SAG.KI AN-*ta* IM.MAR.TU DA É *qát šá* A.MEŠ-*šú šá* [m]*ku-uk-mu-ra-te-e*. None of the sons are otherwise attested.

Most members of the fourth generation are directly attested. Belēssunu appears as the buyer of an allotment in *FB* 16 (1974) no. 23, which is badly damaged. The type of allotment is lost. Lines 11-14 should be restored:

11) . . . [f]GAŠAN-*su-nu* [DUMU.MÍ]
12) [*šá* [md]60-DIN-*iṭ šá* MU-*šú* 2-*ú* [m]*qí-*]*ip-lu-ú-nu* [lú]GAL [lú]SAG URU-*a* [*šá* UNUG[ki] (or *šá* É DINGIR.MEŠ)]
13) [A *šá* [md]60-DIN-*su*-E A [m]*áḫ-*[ʾ]*-ú-tú* DAM [md]60-ŠEŠ-MU-*nu* A *šá*
14) [. . . A [m]*áḫ-*]ʾ*-ú-tú*.

This is the only text in which Belēssunu or her husband appear.

Diophantos appears as a principal in three documents. In each he is the buyer or owner. BRM 2 55 is his purchase of a butcher's allotment (*ṭābiḫūtu*) and an *ērib-bītūtu* allotment. This is an unusual document in that the amount purchased is an entire month rather than the more usual fraction of a few days (lines 7-8: *u mim-ma gab-bi šá ina* TA U₄.1.KÁM *a-di* U₄.30.KÁM ITI-*us-su a-na* GIŠ.ŠUB.BA.MEŠ *ik-kaš-ši-du* . . . , "and whatever pertains to those allotments from day 1 to day 30 monthly . . ."). The price Diophantos paid was very high, 9⅓ minas of silver. Interestingly, all of the principals in this transaction bear Greek names. The seller is Nanâ-iddin, "whose second name is Dēmētrios,"[29] son of Nidintu-Anu, son of Tanittu-Anu, descendant of Aḫʾûtu (lines 1-2). The guarantor is Diophanēs, son of [m]i-si-ra-tu-[ʾ],[30] son of Kidin-Anu, the Urukean ([lú]UNUG[ki]-*a-a*), lines 15-16.

FB 16 (1974) no. 21 also relates to an allotment but the text is very fragmentary and it is not even clear that it is a sale. It could also be a quitclaim. The remains are difficult to interpret. The fragment seems to be from the reverse of the tablet since it ends with a statement of ownership (in the plural: [. . . *ṣa-a-*]*tú šú-nu*, line 6), and parts of the witness list appear to follow. However, the detailed description of the allotment in the preceding lines, including the list of deities before whom services are to be rendered,[31] is unexpected at this point in the contract. In any case, Diophantos is the owner (or co-owner) of the allotment.

The third text in which Diophantos appears is an unpublished real estate sale, A 3682. It concerns a piece of property in the district of the Lugalgirra temple. The property is bounded on the south by a vacant lot belonging to Diophantos, and on the west by a house plot belonging to his father, Kephalōn. Diophantos is the buyer of the property, which is a ruined foundation to be torn up and rebuilt (lines 2-3: . . . SUḪUŠ-*šú ab-tu₄ šá na-qa-ri ù* DÙ-*uš*).

Antiochos, son of Timokratēs, was the buyer of a piece of real estate in the Ištar Gate district: . . . [É]-*šú* NÍG.GA [d]60 *sip-pi rak-su* [é]*ru-gu-bu* [giš]IG [giš]*sik-kat kun-nu*, "a house, property of Anu, (with) a fitted soffit, an upper story, door and latch-peg installed" (BRM 2 37:2).[32] The seller is Anu-ab-uṣur, son of Arad-Rēš, son of Dumqi-Anu, a doorkeeper, who was a member of the Dumqi-Anu family, another prominent business family in Seleucid Uruk.[33]

Three sons of Ina-qibit-Anu are known from the fourth generation. The first is not directly attested—in fact his name is lost. He was the father of Kephalōn, Hēraklidēs, Agathoklēs and

29. On the various spellings of this name see W. Röllig, "Griechische Eigennamenin Texten der babylonischen Spätzeit," *Or*NS 29 (1960) 379 with n. 4; and Sarkisian, *Drevnii Vostok* 2 (1976) 215.

30. The reading is problematic. See Röllig, *Or*NS 29 (1976) 319 n. 1, for the various spellings.

31. See Sarkisian's transliteration, *FB* 16 (1974), 36

32. Translated in part and discussed in Doty, *Archives*, pp. 287-288. On the meaning of *sikkatu* and other terms associated with devices for securing doors, see Erle Leichty, "Omens from Doorknobs," *JCS* 39 (1987) 190-193.

33. The Dumqi-Anu family archive is described in detail in Doty, *Archives*, pp. 270-302, and Bernd Funck, "Zur Widerspiegelung von Basisüberbau-Problemen in den keilschriftlichen Pfründentexten der Seleukidenzeit: Das Archiv des Dumqi-Anu," in Joachim Herrman and Irmgard Sellnow, eds., *Produktivkräfte und Gesellschaftsformationen in vorkapitalistischer Zeit* (Berlin: 1982), pp. 373-387.

Seleukos of generation five. The four sons were the sellers of real estate, a *bīt qāti*, and their uncle, Alexandros of generation four, was the buyer. The text, *FB* 16 (1974) no. 25, is fragmentary and details of the transaction are not clear.[34]

Antiochos, the third son of Ina-qibīt-Anu, is directly attested only in YOS 20 72 (MLC 2166), a real estate sale in which he is the buyer. The property description reads:

2) ^{é}*ru-gu-bu*^{meš} *šá muḫ-ḫi ku-bur-ru-ú šá tab-ku* IL at ḫa mu ú
3) *šá ina* ^{é}*iri*$_{10}$*-gal* UŠ AN-*ú* IM.SI.SÁ DA *a-ma-áš-tu*$_4$ *qal-líl-tu*$_4$
4) *šá* KÁ IM.SI.SÁ UŠ KI-*ú* IM.U$_x$.LU DA E$_2$ *qát šá* ^{md}60-DUMU-MU-*nu*
5) A *šá* ^{md}*na-na-a*-MU A ^{m}*ḫun-zu-ú* SAG.KI AN-*ta* IM.MAR.TU DA
6) É *qát šá* A.MEŠ-*šú šá* ^{m}*ku-uk-mu-ra-te-e* A *šá* ^{md}60-DIN-*su*-E A ^{m} (sic)
7) *áḫ-*$^{?}$*-ú-tú* SAG.KI KI-*ta* IM.KUR.RA DA É *qát šá* ^{md}60-DUMU[-MU-*nu*]
8) A *šá* ^{md}*na-na-a*-MU A ^{m}*ḫun-zu-ú* . . .

". . . upper stories which are over against the doorframe of ??? which is in the Irigal: the upper long side on the north bordering on a weakened dividing wall of the North Gate; the lower long side on the south bordering on the 'hand house' of Anu-mar-ittannu, (5) son of Nanâ-iddin, descendant of Ḫunzû; the upper short side on the west bordering on the 'hand house' of the sons of Kukmuratē(?), son of Anu-balāssu-iqbi, descendant of Aḫ$^{?}$ûtu; the lower short side on the east bordering on the 'hand house' of Anu-mar-ittannu, son of Nanâ-iddin, descendant of Ḫunzû . . . ."

Apart from YOS 20 72, Antiochos appears only in *FB* 16 (1974) no. 2 = no. 16 where his wife, Antu-banāt=Ereštu-Nanâ, is the seller.[35] This is a sale by Antu-banāt of a 1/6 of a day share in the butcher's allotment on the 23rd of the month. It is an important document in that it supplies a link between the Kephalōn family and two other business families of Seleucid Uruk. The buyer is Idat-Anu, son of Dumqi-Anu, son of Arad-Rēš, a member of the Dumqi-Anu family mentioned above. Antu-banāt herself is a member of the very extensive Dannat-Bēlti family, whose business interests were far-flung.[36] Thus she provides a marriage link between that family and the Kephalōn family.

In generation five of the Kephalōn family Anu-balāssu-iqbi, son of Antu-banāt and Antiochos, appears in the *ina milki* clause in the document just discussed, *FB* 16 (1974) no. 2 = no. 16. The four brothers, Kephalōn, Hēraklidēs, Agathoklēs and Seleukos, were the sellers of real estate in FB 1974 no. 25, the fragmentary text discussed earlier, in which Alexandros was the buyer.

Of the two remaining members of the fifth generation, Aristōn is known only as a witness in a dedication of a slave, BRM 2 53:21. Interestingly, the person dedicating the slave also bears a Greek name: Nikanōr, son of Dēmokratēs.

The name of the last documented member of the Kephalōn family is incomplete. He is attested in A 3690, a somewhat damaged dedication of slaves dated to year 115 of the Arsacid Era (133/132 BCE). The slaves are dedicated to Anu and Antu . . . *a-na muḫ-ḫi bul-ṭu šá* ^{m}*ar-sak-*$^{?}$ LUGAL *a-na muḫ-ḫi bul-ṭu šá* IM-*šú a-na muḫ-ḫi bul-ṭu <<a-na muḫ-ḫi>> šá* UN.MEŠ-*šú u* A.MEŠ-*šú*, "for the sake of the life of Arsaces the king, for the sake of his own life, (and) for the sake of the life of his people and his children" (lines 5-7).

34. See Sarkisian's transliteration, *FB* 16 (1974) 38-39, and translation on p. 48.

35. Edited and translated by Sarkisian, *FB* 16 (1974) 27 and 42. In line 3 read *mil-ki* instead of *iš-qí* and translate "on the advice of" rather than "from the share of."

36. Antu-banāt would be in generation six of the Dannat-Bēlti family. Her father, Anū-balāssu-iqbi, is the son of Šamaš-ēṭir and therefore the brother of Balāṭu and Anu-mar-ittannu. These people should be added to the family tree in Doty, *Archives*, figure 6, p. 229. The Dannat-Bēlti family is discussed in detail in Doty, *Archives* on pp. 229-269.

Although the Kephalōn family archive consists of only fourteen documents in which family members are actually principals, some preliminary observations are in order. Family interests were concentrated in allotments, primarily the *ṭābiḫūtu* and *ērib-bītūtu*. The women members, Antiochis, Belēssunu and Antu-banāt, were especially active as buyers of allotments, although Diophantos was equally active. The real estate transactions are scattered among various family members and the land involved does not appear to have been concentrated in one particular part of the city. From property descriptions in real estate sales to which members of the family were not parties we know of additional land holdings.

The most striking characteristic of the Kephalōn family is the large number of persons with Greek names. Of twenty six persons directly or indirectly attested, fourteen have Greek names and only one of those is a second name. Although Akkadian names continue to appear in each generation, by the fourth attested generation the names of family members are overwhelmingly Greek. Direct dated attestations of members of generations four and five range from 179 to 132 BCE, corresponding roughly to the reign of Antiochos IV and his successors, while Anu-uballiṭ= Kephalōn, the patriarch of the family, flourished during the reign of Antiochos III.

In some respects the family of Anu-uballiṭ=Nikarchos stands in marked contrast to that of Kephalōn. Thirty family members are documented in the texts accessible to me, but only one, Nikarchos himself, bears a Greek name. This is despite the fact that, chronologically, generations three through five of the Nikarchos family correspond roughly to generations three and four of the Kephalōn family, of which nearly half of the members do have Greek names. In addition, the business activities of the members of the Nikarchos family show a marked degree of specialization. Of the nine documents in which family members are principals, all have to do with real estate.

The evidence for Anu-uballiṭ=Nikarchos has been presented above. His father, Anu-ikṣur, is known only from the patronymics of family members.

Many of the members of the Nikarchos family are attested not as principals in contracts but as witnesses. These are noted in the documentation, Table 2. Of the members of generation three only Anu-ab-utīr appears outside of patronymics or witness lists. However, the occurrences of Anu-ab-utīr present a chronological problem. A person by this name appears as a land owner in the property description in BRM 2 38, a sale of a vacant lot in the *é*-MI-*ḫal-la-ke*$_4$[37] district of Uruk. He is the owner of an orchard (KIRI$_6$ ^{giš}GIŠIMMAR, line 4) on the south side of the property being described.[38] His orchard is on the bank of the Ištar canal which flowed along the east side of the property. An Anu-ab-utīr also appears as an owner of property in the Lugalgirra Temple district. This is from the property description in a quitclaim, A 3685 (line 8), a document which brings together four other family members. It will be discussed below in connection with Anu-bēlšunu and Anu-balāssu-iqbi of generation four.

Even though the patronymics of Anu-ab-utīr in both BRM 2 38 and A 3685 seem to fit into generation three, both texts are dated much later than one would expect (139 SE and 155 SE respectively). The other attestation of Anu-ab-utīr is as a witness in YOS 20 27 (MLC 2181), dated 58 SE. It is unlikely, indeed impossible, that the same person could have been of age to serve as a witness and still be active 97 years later. Perhaps in this case the two later texts, in which Anu-ab-utīr appears in property descriptions (but as neither principal nor witness in the

37. Collated. The É and following signs (line 2) are quite clear.

38. His father's name is spelled oddly: ^{m}*ni-iq-ar-qu-ra-s*[*u*] (line 5). Collation shows that the copy is correct, and that there are traces of the *su* following the *ra*.

contracts), the property is still in the hands of the family of Anu-ab-utīr even though he himself is dead. Perhaps the scribes were simply not careful to designate the property as belonging to the children rather than to Anu-ab-utīr himself.[39]

In generation four, two sons of Anu-ab-utīr are known from the real estate sale BRM 2 38 in which Anu-ab-utīr appeared as a property owner. Anu-uballiṭ and Anu-aḫḫē-iddin were the sellers.

Three other members of the fourth generation are attested in the quitclaim A 3685. They are Anu-bēlšunu/Anu-aḫḫē-iddin, the beneficiary; Anu-balāssu-iqbi/Anu-bēlšunu, who waived his claim in favor of Anu-bēlšunu; and Anu-zēr-iddin/Anu-aḫḫē-iddin, brother of Anu-bēlšunu, who appears as a land owner in the property description. The document concerns a house and its vacant lot in the district of the Lugalgirra temple.

Anu-ab-uṣur/Anu-bēlšunu, the brother of the Anu-balāssu-iqbi who was the beneficiary in A 3685 (above), appears as the buyer of a piece of real estate, a "hand house" with associated structures, in *VDI* 1955/4 no. 3. The sellers of the property all have Greek names, although they are descended from persons with Babylonian names. The four brothers, Athēniōn, Athēnophilos, Athēnodōros and Kephalōn,[40] are said to be members of the collegium of the temple of Uruk, i.e., the Rēš temple, lines 2-3.

One other member of generation four is attested in YOS 20 78 (NCBT 2304), a division of property. He is Anu-aḫ-iddin/Nidintu-Anu, who is cited in the property description as the owner of a garden (KIRI$_6$) in the Adad Temple district (line 5).

Anu-zēr-iddin/Nidintu-Anu has the distinction of being the best known member of the Nikarchos family outside of Nikarchos himself. He is the buyer in three real estate sale documents, all of which deal with land located in the Adad Gate district of Uruk. Indeed, all three plots were located along the same street and two of them were contiguous. Figure 3 is a schematic plan of Anu-zēr-iddin's land purchases.

The earliest of the three documents is VAS 15 47 dated 20[+].VII.120 SE (20[+] October 192 BCE). The text reads, in part, as follows:

1) ^{md}60-ŠEŠ.MEŠ-*mu* ^{m}*m[an-nu-i-qa-bu*[41] A.MEŠ] *šá* ^{md}60-GI A *šá* ^{m}*ḫun-zu-ú*
2) *ina ḫu-ud lìb-bi-šú*[*-nu mi-šil*] ḪA.LA-*šú-nu gab-bi šá ina* É.IM.U$_x$.LU É x[. . .]
3) *ù* ⌜*ri*⌝-*bu*⌜-*ú*⌝ [ḪA.LA-*šú-*]*nu gab-bi šá ina* É *ku-tal šá* KI-*tim* KÁ.GAL ^{d}IM [*šá qé-reb* UNUG^{ki} x KÙŠ UŠ AN-*ú* IM.SI.SÁ]
4) DA [. . .]x *šá* ^{md}INANNA-MU-KÁM ^{lú}x[. . .]x-*nu* A *šá* ^{m}NÍG.SUM.MU[-^{d}60]
5) *u* ^{md}UTU-MU-*nu u* ^{m}*ana*-GAL-^{d}60 A.MEŠ *šá* ^{m}*ba-l*[*a-ṭu* x KÙŠ U]Š KI-*ú* IM.U$_x$.LU [DA . . .]
6) ^{m}*ana*-GAL-^{d}60 A *šá* ^{m}*ba-la-ṭu u* ^{f}KÁM-*tu*$_4$-[^{d}*na-na-a* DAM-]*šú* 11 KÙŠ SAG.KI AN-*ta* [IM.MAR.TU]
7) DA SILA SIG *mu-taq* UN.MEŠ 11 KÙŠ SAG.KI KI-*ta* ⌜IM.KUR⌝.RA DA ^{é}*a-su-up-pu*^{meš} [*šá* ^{m}*ana*-GAL-^{d}60]
8) *u* ^{f}KÁM-*tu*$_4$-^{d}*na-na-a* DAM-*šú meš-ḫat* 2-*tu*$_4$ É *ku-tal* MU.MEŠ 37½ KUŠ [UŠ AN-*ú* IM.SI.SÁ]
9) DA *ki-šub-ba-a šá* A.MEŠ *šá* ^{m}*ba-la-ṭu* 36 KÙŠ UŠ KI-*ú* IM.U$_x$.[LU DA]
10) [*a-*]*maš-tu*$_4$ É.IM.U$_x$.LU MU.MEŠ 23½ KÙŠ SAG.KI AN-*ta* IM.MAR.TU DA [SILA SIG *mu-taq* UN.MEŠ]
11) 21 KÙŠ <SAG.KI KI-*ta*> IM.KUR.RA DA ^{é}*a-su-up-pu*^{meš} *šá* ^{m}*ana*-GAL-^{d}60 [A *šá* ^{m}*ba-la-ṭu*]
12) *u* DA *mu-ṣu-ú šá* É MU.MEŠ PAB 2-*ta meš-ḫat*^{meš} É.IM.U$_x$.LU *u* [É . . .]

39. Note by contrast the property description in YOS 20 65 (NCBT 1936), presented below, in which there is property belonging to unnamed sons of Balāṭu and of Ina-qibīt-Anu.

40. On the reading of the names see Sarkisian, *Drevnii Vostok* 2 (1976) 215-216; and Röllig, *Or*NS 29 (1960) 378-379.

41. Restored on the basis of line 22.

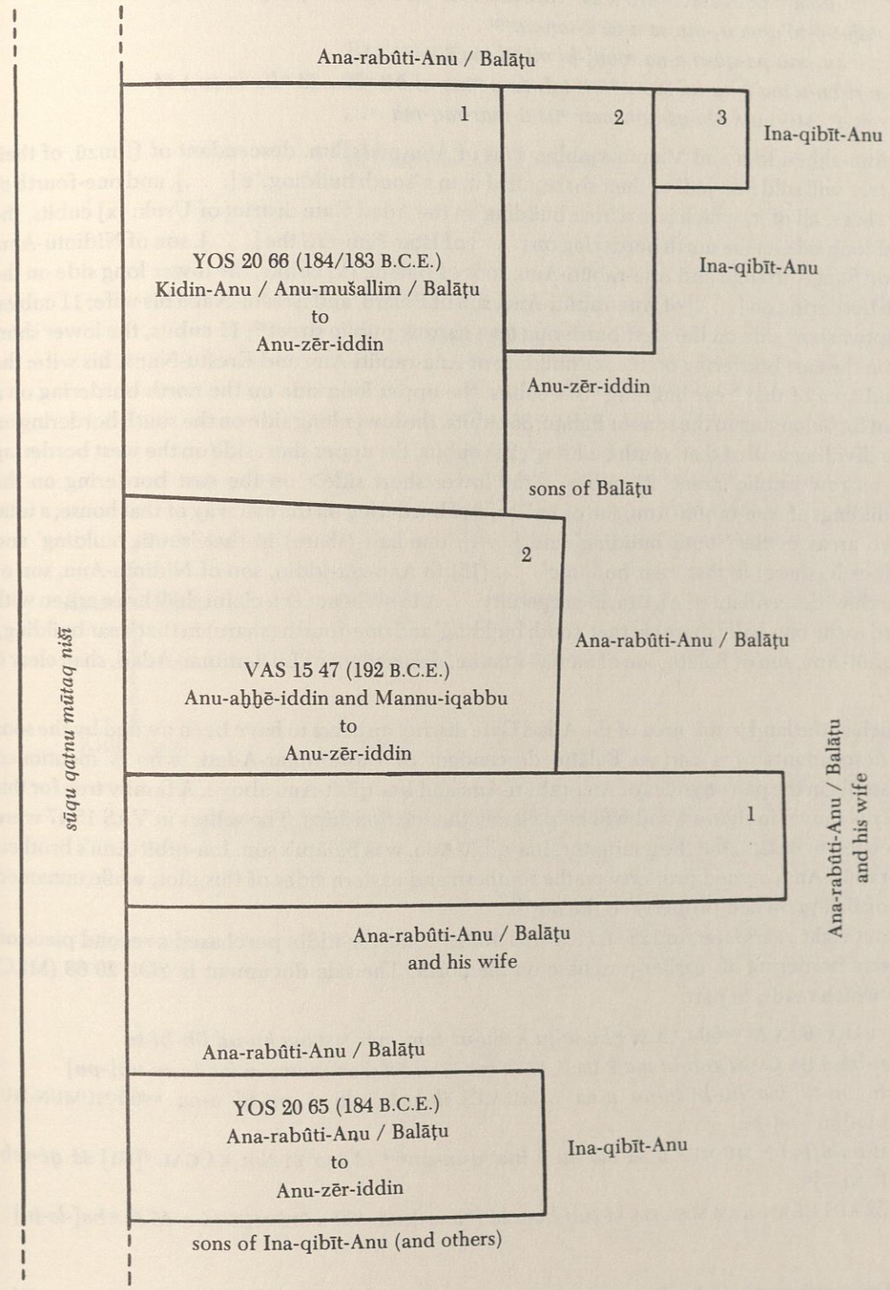


FIGURE 3: PROPERTY OF ANU-ZĒR-IDDIN

13) *mi-šil ina* É.IM.1 *u ri-bu-ú ina* É *ku-tal* MU.MEŠ . . .
15) . . . *a-na* ^{md}60-NUMUN-MU A *šá* ^{m}NÍG.SUM.MU-^{d}60 A *šá* ^{m}*ni-iq-ar*[*-ku-su* A]
16) ^{m}*áḫ-ʾ-ú-tú a-na* u_4*-mu ṣa-a-tú it-tan-nu*^{meš} . . .
18) . . . u_4*-mu pa-qa-ri a-na muḫ*[*-ḫi mi-šil ina* É.IM.U_x.LU]
19) *u ri-bu-ú ina* É *ku-tal* MU.MEŠ *it-tab-šu-ú* ^{m}*ina-qí-bit-*^{d}60 A *šá* ^{m}*ba-la-ṭu* A *šá*
20) ^{md}UTU-MU-*nu* A ^{m}*lu-uš-tam-mar-*^{d}IM *ú-mar-raq-ma* . . .

"(1) Anu-aḫḫē-iddin and Mannu-iqabbu, sons of Anu-mušallim, descendant of Ḫunzû, of their own free will sold one-half of their share, all of it, in a 'south building,' a [. . .], and one-fourth of their share, all of it, which is in a 'rear building' in the Adad Gate district of Uruk: [x] cubits, the upper long side on the north bordering on [. . .] of Ištar-šum-eriš the [. . .], son of Nidintu-Anu, (5) and Šamaš-ittannu and Ana-rabûti-Anu, sons of Balāṭu; [x] cubits, the lower long side on the south bordering on [. . .] of Ana-rabûti-Anu, son of Balāṭu, and Ereštu-Nanâ his wife; 11 cubits, the upper short side on the west bordering on a narrow public street[42]; 11 cubits, the lower short side on the east bordering on the outbuilding of Ana-rabûti-Anu and Ereštu-Nanâ, his wife; the second area of that 'rear building': 37½ cubits, the upper long side on the north bordering on a vacant lot belonging to the sons of Balāṭu; 36 cubits, the lower long side on the south bordering on (10) a dividing wall of that 'south building'; 23½ cubits, the upper short side on the west bordering on a narrow public street; 21 cubits, <the lower short side> on the east bordering on the outbuildings of Ana-rabûti-Anu, son of Balāṭu, and bordering on the exit way of that house; a total of two areas of the 'south building' and [. . .]; one-half (share) in that 'south building' and one-fourth (share) in that 'rear building' . . . (15) to Anu-zēr-iddin, son of Nidintu-Anu, son of Nikarchos, descendant of Aḫʾûtu, in perpetuity . . . (18) Whenever a claim shall have arisen with regard to the one-half (share) in that 'south building' and one-fourth (share) in that 'rear building,' Ina-qibīt-Anu, son of Balāṭu, son of Šamaš-ittannu, descendant of Luštammar-Adad, shall clear it . . . ."

Much of the land in this area of the Adad Gate district appears to have been owned by the sons and descendants of a certain Balāṭu, descendant of Luštammar-Adad, who is mentioned repeatedly in the patronymics of Ana-rabûti-Anu and Ina-qibīt-Anu above. A family tree for this family is shown in figure 4 and will help clarify the relationships. The sellers in VAS 15 47 were not related to Balāṭu, but the guarantor, Ina-qibīt-Anu, was Balāṭu's son. Ina-qibīt-Anu's brother, Ana-rabûti-Anu, owned property on the southern and eastern sides of this plot, while unnamed sons of Balāṭu owned property to the north.

About eight years later, in 128 SE (184/183 BCE),[43] Anu-zēr-iddin purchased a second piece of property bordering his earlier purchase on the north. The sale document is YOS 20 66 (MLC 2187) which reads, in part:

1) ^{m}BARÁ-^{d}60 A *šá* ^{md}60-GI A *šá* ^{m}*ba-la-ṭu* A ^{m}*lu-uš-tam-mar-*^{d}IM *ina ḫu-ud lìb-bi-šú*
2) *ri-bu-ú* ḪA.LA-*šú gab-bi ina* É.IM.U_x.LU *u ina* É *ku-tal ú sa-ma-nu-ú ina* ^{é}*a-su-up*[*-pu*]
3) *šá mi-šil ina lìb-bi-šú-nu a-na* É MU.MEŠ *ik-kaš-ši-du ù mi-šil a-na* ^{md}60-NUMUN-MU *ma-*^{r}*ḫir*^{1}*-ra*[*-nu*]
4) *ri-bu-ú ina* É MU.MEŠ *ù sa-ma-nu-ú ina* ^{é}*a-su-up*^{meš} *šá ina* KI-*tim* KÁ.GAL ^{d}[IM] *šá qé-reb* [UNUG]^{ki}
5) 32 KÙŠ UŠ AN-*ú* IM.SI.SÁ DA *ki-šub-ba-a šá* [^{m}*ana-*]GAL-^{d}60 *u* ŠEŠ.MEŠ-*šú* A-*šú šá* ^{m}*ba*[*-la-ṭu*]

42. This is not the name of a specific street, but a general descriptive term. See Falkenstein, *Topographie*, p. 53.
43. The date is damaged but the probable reading is [MU.1-*me*-2]8.KÁM ^{m}*si-lu-ku* LUGAL. The name of the scribe is lost, but his patronymic is the same as that of Anu-aḫ-iddin, the scribe of VAS 15 47.

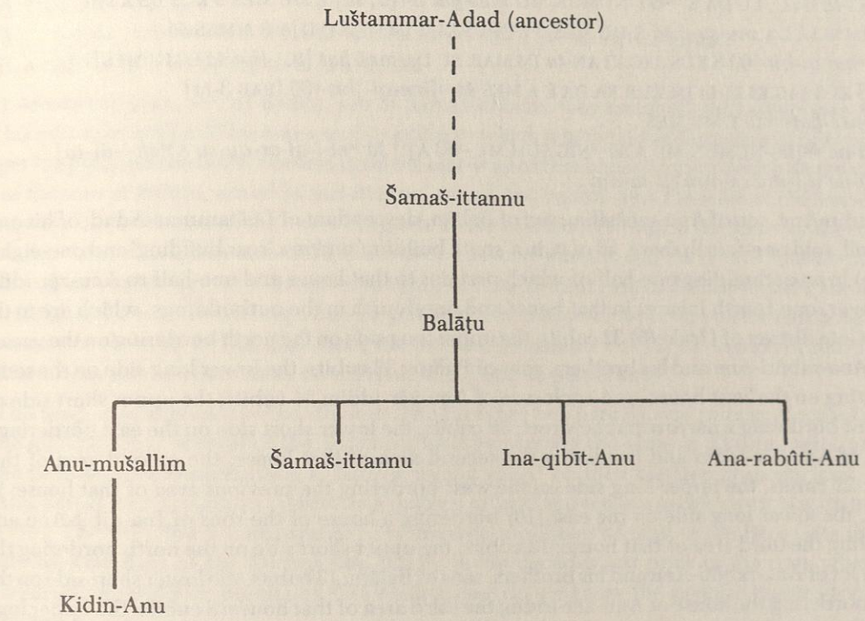


FIGURE 4: THE FAMILY OF BALĀṬU

6) 32 KÙŠ UŠ KI-*ú* IM.U$_x$.LU DA É.IM.KUR.RA *u* TÙR *šá* ^{md}60-NUMUN-MU 34 KÙŠ
7) SAG.KI AN-*ta* IM.MAR.TU DA SILA SIG *mu*[*-taq*] UN.MEŠ 36 KÙŠ SAG.KI KI-*ta*
8) IM.KUR.RA DA É ^{md}60-NUMUN-MU *u* DA *meš-ḫat* 2-*tu*$_4$ *šá* É MU.MEŠ *meš-ḫat* 2-*tu*$_4$ *šá* É MU.MEŠ
9) 22 KÙŠ UŠ AN-*ú* IM.MAR.TU DA *meš-ḫat* IGI-*tim šá* É MU.MEŠ 22 KÙŠ UŠ KI-*ú* IM.KUR.RA
10) DA É A.MEŠ *šá* ^{m}*ina-qí-bit-*^{d}60 *u* DA *meš-ḫat* 3-*tu*$_4$ *šá* É MU.MEŠ 13 KÙŠ SAG.KI AN-*ta*
11) IM.SI.SÁ DA *ki-šub-ba-a šá* ^{m}*ana*-GAL-^{d}60 *u* ŠEŠ.MEŠ-*šú* A.MEŠ *šá* ^{m}DIN 13 KÙŠ SAG.KI
12) KI-*ta* IM.U$_x$.LU DA É ^{md}60 -NUMUN-MU *meš-ḫat* 3-*t*[*u*$_4$ *šá*] É MU.MEŠ 8 KÙŠ UŠ AN-*ú*
13) IM.SI.SÁ DA *mu-ṣu-ú šá* É MU.MEŠ 8 KÙŠ UŠ KI-*ú* IM.[U$_x$.LU D]A É A.MEŠ *šá*
14) ^{m}*ina-qí-bit-*^{d}60 8 KÙŠ SAG.KI AN-*ta* IM.MAR.TU DA *meš-ḫat* [IGI-*tim šá* É MU.MEŠ]
15) 8 KÙŠ SAG.KI KI-*ta* IM.KUR.RA DA É A.MEŠ *šá* ^{m}[*ina-qí-*]*bit-*^{d}60 [PAB 3-*ta*]
16) *meš-ḫat*^{meš} *šá* É MU.MEŠ . . .
20) *a-na* ^{md}[60-NUMUN-MU A *šá* ^{m}NÍG.SUM.MU-^{d}60 A][44] *šá* ^{m}*ni-i-qí-ar-qu-su* A ^{m}*áḫ-*$^{\circ}$*-ú*[*-tú*]
21) *a-na* u_4[*-mu ṣa-a-tú*] *it-ta-din* . . .

"(1) Kidin-Anu, son of Anu-mušallim, son of Balāṭu, descendant of Luštammar-Adad, of his own free will, sold one-fourth share, all of it, in a 'south building' and in a 'rear building' and one-eighth (share) in an outbuilding one-half of which pertains to that house and one-half to Anu-zēr-iddin the buyer, one-fourth (share) in that house and one-fourth in the outbuildings, which are in the Adad Gate district of Uruk: (5) 32 cubits, the upper long side on the north bordering on the vacant lot of Ana-rabûti-Anu and his brothers, sons of Balāṭu; 32 cubits, the lower long side on the south bordering on the 'east house' and enclosure of Anu-zēr-iddin; 34 cubits, the upper short side on the west bordering a narrow public street; 36 cubits, the lower short side on the east bordering a house of Anu-zēr-iddin and bordering the second area of that house; the second area of that house: 22 cubits, the upper long side on the west bordering the previous area of that house; 22 cubits, the lower long side on the east (10) bordering a house of the sons of Ina-qibīt-Anu and bordering the third area of that house; 13 cubits, the upper short side on the north bordering the vacant lot of Ana-rabûti-Anu and his brothers, sons of Balāṭu; 13 cubits, the lower short side on the south bordering the house of Anu-zēr-iddin; the third area of that house: 8 cubits, the upper long side on the north bordering the exit-way of that house; 8 cubits, the lower long side on the south bordering the house of the sons of Ina-qibīt-Anu; 8 cubits, the upper short side on the west bordering the previous area of that house; (15) 8 cubits, the lower short side on the east bordering the house of the sons of Ina-qibīt-Anu—a total of three areas which (constitute) that house, . . . (2) to Anu-zēr-iddin, son of Nidintu-Anu, son of Nikarchos, descendant of Aḫ$^{\circ}$ûtu, in perpetuity."

This second purchase of land by Anu-zēr-iddin lies to the north of and borders on that purchased earlier. The seller in this transaction is Kidin-Anu, a grandson of Balāṭu. The property was bounded by property belonging to both Ana-rabûti-Anu and the sons of Ina-qibīt-Anu, but also, on the south, by property now also belonging to Anu-zēr-iddin. He must have purchased this plot sometime between 192 and 184 BCE but the document attesting this sale has not been discovered.

Anu-zēr-iddin's third purchase of land was also made in 184/183 BCE (8.[ ].128 SE). The document, YOS 20 65 (NCBT 1936), reads in part:

1) [^{m}*ana-GAL-*]^{d}60 A *šá* ^{m}*ba-la-ṭu* A *šá* ^{id}UTU-MU-*nu* <A> ^{m}*lu-uš-tam-mar-*^{d}IM [*ina ḫu-ud lib-bi-šú*]
2) É-*su ép-šú ù mu-ṣu-ú-šú šá ina* KI-*tim* KÁ.GAL ^{d}IM *šá qé-reb* UNUG^{ki}

44. Restored from the transfer of ownership clause, lines 30-31.

3) UŠ AN-*ú* IM.SI.SÁ DA *mu-ṣu-ú šá* É MU.MEŠ *ù* DA *ki-šub-ba-a*
4) *šá* A.ME[Š *šá* ^{m}*b*]*a-la-ṭu* A *šá* ^{md}UTU-MU-*nu ù šá* ^{m}*ana*-GAL-^{d}60 *na-din-na* É *ù* DA
5) É-$^{\lceil}$*šú* UŠ$^{\rceil}$ [KI-*ú* I]M.U$_x$.LU DA É A.MEŠ *šá* ^{m}*ina-qí-bit-*^{d}60 *šá en-na kul-lu*^{meš}
6) A.MEŠ *šá* ^{md}60-DUMU-MU-*nu ù* A.MEŠ *šá* ^{md}60-ŠEŠ-GUR ^{lú}ŠU.I *ù* DA É A.MEŠ *šá*
7) ^{md}60-AD-ŠEŠ [A *šá* ^{m}]^{d}UTU-MU-*nu* SAG.KI AN-*ta* IM.MAR.TU DA SILA SIG *mu-taq* UN.MEŠ
8) SAG.KI KI-*ta* IM.KUR.RA DA É A.MEŠ *šá* ^{m}*ina-qí-bit-*^{d}60 A *šá*
9) ^{md}UTU-MU-*nu* . . .
12) . . . *a-na* ^{md}60-NUMUN-MU A *šá* ^{m}NÍG.SUM.MU-^{d}60 A *šá* ^{m}*ni-i-qí-ar-qu-su*
13) A ^{m}*áḫ-*$^{\circ}$*-ú-tú a-na* u_4*-mu ṣa-a-tú it-ta-din*

"(1) Ana-rabûti-Anu, son of Balāṭu, son of Šamaš-ittannu, <descendant> of Luštammar-Adad, [of his own free will] sold his house and its exit way which is in the Adad Gate district of Uruk: the upper long side on the north bordering on the exit-way of that house and bordering on the vacant lot of the sons of Balāṭu, son of Šamaš-ittannu, and of Ana-rabûti-Anu, the seller of the house, and bordering on (5) his house; the lower long side on the south bordering on the house of the sons of Ina-qibīt-Anu, which they now hold, the sons of Anu-mar-ittannu, and the sons of Anu-ab-utīr the barber, and bordering on the house of the sons of Anu-ab-uṣur, son of Šamaš-ittannu; the upper short side on the west bordering a narrow public street; the lower short side on the east bordering the house of the sons of Ina-qibīt-Anu, son of Šamaš-ittannu . . . (12) to Anu-zēr-iddin, son of Nidintu-Anu, son of Nikarchos, descendant of Aḫ$^{\circ}$ûtu, in perpetuity."

This property, although not contiguous with the other two parcels, was certainly located in the same general area. Several of the adjoining land owners are the same in all three texts, and all three parcels were ranged along a "narrow public street" on their western property lines.

Anu-zēr-iddin's purchases constitute a pattern of land acquisition in this particular district of the city. The situation is comparable to systematic purchases of land in the Ištar Gate district made by members of the Dumqi-Anu family in the decades just prior to the time when our Anu-zēr-iddin made his purchases.[45] In neither case do we know the specific reasons for these activities.

The remaining members of the Nikarchos family are known only from witness lists. We know nothing of their business activities, if any.

Although the evidence for the Kephalōn and Nikarchos families collected here is sufficient to reconstruct their family relationships, we have only a little helpful information about the activities of family members. In certain cases, such as Antiochis of the Kephalōn family and Anu-zēr-iddin/Nidintu-Anu of the Nikarchos family, there appears to be a degree of specialization in certain kinds of business activity. However, the evidence is scanty and that impression could be altered by discovery of only a few more documents.

Insofar as name-giving is an indicator of cultural integration, we can say that the Kephalōn family represents a hellenized Babylonian family, while the Nikarchos family maintained its Babylonian identity. But as far as participation in those aspects of the business life of Uruk which continued to be documented in cuneiform[46] is concerned, there is no perceptible difference. The two Anu-uballiṭs, Nikarchos and Kephalōn, and their descendants, provide a tantalizing glimpse of city administration and private business life in a city of hellenistic Babylonia, but one which raises more questions than it answers.

45. See Doty, *Archives*, pp. 285-302.
46. That such business activities were highly restricted has been demonstrated in Doty, *Archives*, pp. 308-33

TABLE 1: THE KEPHALŌN FAMILY

Documentaion

Family members are listed below in the order in which they appear on the family tree shown in Figure 1, reading each generation from top to bottom.

Generation 1		
Anu-aḫ-ittannu		
TCL 6 1	patronymic	4.II.91 SE
FB 16 (1974) no. 1	patronymic	3+.III?.91 SE
VAS 15 42	patronymic	date lost
Generation 2		
Diophantos		
YOS 20 54 (NCBT 1962)	patronymic	[ ].[ ].115 SE
A 3678	patronymic	3.VIII.121? SE
Anu-balāssu-iqbi		
TCL 6 1	owner of omen tablet	4.II.91 SE
FB 16 (1974) no. 1	lessee and seller of arable land on behalf of the temple	3+.III?.91 SE
Topographie, p. 6	patronymic	2.I.110 SE
YOS 20 54 (NCBT 1962)	patronymic	[ ].[ ].115 SE
A 3678	patronymic	3.VIII.121? SE
VAS 15 12	patronymic	17.I.130 SE
BRM 2 37	patronymic	16.[ ].133 SE
FB 16 (1974) no. 2 = 16	patronymic	2.XII.155 SE
A 3682	patronymic	date lost
BRM 2 55	patronymic	date lost
FB 16 (1974) no. 21	patronymic	date lost
FB 16 (1974) no. 25	patronymic	date lost
VAS 15 42	patronymic	date lost
Šamaš-ēṭir		
FB 16 (1974) no. 2 = 16	patronymic	2.XII.155 SE
Generation 3		
[. . .]		
FB 16 (1974) no. 23	patronymic	date lost
Antiochis		
YOS 20 54 (NCBT 1962)	buyer of *ērib-bītūtu* allotment	[ ].[ ].115SE
A 3678	buyer of allotment	3.VIII.121? SE
VAS 15 7	buyer of *ērib-bītūtu* allotment	date lost

Anu-uballiṭ (Kephalōn)		
Topographie, p. 6	building inscription on bricks	2.I.110 SE
YOS 20 54 (NCBT 1962)	husband of principal (Antiochis)	[ ].[ ].115 SE
A 3678	husband of principal (Antiochis)	3.VIII.121? SE
VAS 15 12	owner of slave who appears in property description	17.I.130 SE
A 3682	land owner in property description	date lost
VAS 15 7	husband of principal (Antiochis)	date lost
BRM 2 55	patronymic	date lost
FB 16 (1974) no. 23	patronymic	date lost
Timokratēs		
BRM 2 37	patronymic	16.[ ].133 SE
Anu-bēlšunu		
VAS 15 42	buyer in real estate sale	date lost
VAS 15 12	patronymic	17.I.130 SE
Ina-qibīt-Anu		
FB 16 (1974) no. 25	patronymic	date lost
Kukmuratē(?)		
YOS 20 72 (MLC 2166)	patronymic	3.[ ].146 SE
Anu-balāssu-iqbi		
FB 16 (1974) no. 2 = 16	patronymic	2.XII.155 SE
Generation 4		
Anu-aḫ-ittannu		
FB 16 (1974) no. 23	husband of principal (Belēssunu)	date lost
Belēssunu		
FB 16 (1974) no. 23	buyer of allotment	date lost
Diophantos		
A 3682	buyer in real estate sale	date lost
BRM 2 55	buyer of *ērib-bītūtu* and *ṭābiḫūtu* allotments	date lost
FB 16 (1974) no. 21	allotment owner in sale (or quitclaim?)	date lost
A 3690	patronymic	4.III.115 AE (179 SE)
BRM 2 53	patronymic	[ ].V.180 SE
Antiochos		
BRM 2 37	buyer in real estate sale	16.[ ].133 SE
[. . .]		
FB 16 (1974) no. 25	patronymic	date lost

Alexandros		
FB 16 (1974) no. 25	buyer in real estate sale	date lost
Antiochos		
FB 16 (1974) no. 2 = 16	husband of principal (Antu-banāt); patronymic	2.XII.155 SE
YOS 20 72 (MLC 2166)	buyer in real estate sale	3.[ ].146 SE
Antu-banāt (Ereštu-Nanâ)		
FB 16 (1974) no. 2 = 16	seller of *ṭābiḫūtu* allotment	2.XII.155 SE
Generation 5		
Aristōn		
BRM 2 53	witness	[ ].V.180 SE
[. . .]-dēmos		
A 3690	dedicator of slaves	4.III.115 AE (179 SE)
Kephalōn		
Hēraklidēs		
Agathoklēs		
Seleukos		
FB 16 (1974) no. 25	sellers in real estate sale	date lost
Anu-balāssu-iqbi		
FB 16 (1974) no. 2 = 16	guarantor and in *ina milki* clause in allotment sale	2.XII.155 SE

TABLE 2: THE NIKARCHOS FAMILY

Documentation

Family members are listed below in the order in which they appear on the family tree shown in Figure 2, reading each generation from top to bottom.

Generation 1		
Anu-ikṣur		
YOS 1 52	patronymic	8.I.68 SE
Generation 2		
Anu-uballiṭ (Nikarchos)		
YOS 1 52	building inscription describing rebuilding of parts of the Rēš temple	8.I.68 SE
YOS 20 46 (NCBT 1958)	land owner in property description	[ ].[ ].98 SE
YOS 20 27 (MLC 2181)	patronymic	24.[ ].58 SE
YOS 20 31 (MLC 2164)	patronymic	22.VI.67 SE
BRM 2 20 = YOS 20 34 (MLC 2178)	patronymic	20.VI.71 SE
YOS 20 42 (NCBT 1937)	patronymic	17.XII².85 SE
YOS 20 43 (MLC 2170)	patronymic	20.IV.88 SE
A 3680	patronymic	3.IV.92 SE
YOS 20 62 (YBC 11633)	patronymic	13.[ ].100+ SE
VAS 15 48	patronymic	17.V.102 SE
YOS 20 52 (NCBT 1971)	patronymic	3.IX.108 SE
BRM 2 31	patronymic	18.IX.118 SE
VAS 15 32	patronymic	21.IX.119 SE
VAS 15 47	patronymic	20+.VII.120 SE
BRM 2 33	patronymic	28.III.124 SE
YOS 20 65 (NCBT 1936)	patronymic	8+.[ ].128 SE
YOS 20 66 (MLC 2187)	patronymic	[ ].[ ].128 SE
VAS 15 34	patronymic	2.XI.133 SE
YOS 20 69 (MLC 2197)	patronymic	18.[ ].138 SE
BRM 2 38	patronymic	12.V.139 SE
BRM 2 44	patronymic	25.II.154 SE
A 3685	patronymic	6.VII.155 SE
VDI 1955/4 no. 3	patronymic	20.XI.159 SE
FB 16 (1974) no. 8	patronymic	date lost
Generation 3		
Anu-ab-utīr		
YOS 20 27 (MLC 2181)	witness	24.[ ].58 SE
BRM 2 38	land owner in property description	12.V.139 SE

A 3685	land owner in property description	6.VII.155 SE
Anu-aḫḫē-iddin		
A 3685	patronymic	6.VII.155 SE
Anu-bēlšunu		
YOS 20 43 (MLC 2170)	witness	20.IV.88 SE
VAS 15 48	patronymic	17.V.102 SE
YOS 20 52 (NCBT 1971)	patronymic	3.IX.108 SE
BRM 2 31	patronymic	18.IX.118 SE
VAS 15 32	patronymic	21.X.119 SE
BRM 2 33	patronymic	28.III.124 SE
YOS 20 69 (MLC 2197)	patronymic	18.[ ].138 SE
BRM 2 44	patronymic	25.II.154 SE
A 3685	patronymic	6.VII.155 SE
VDI 1955/4 no. 3	patronymic	20.XI.159 SE
Anu-ikṣur		
A 3680	witness	3.IV.92 SE
Ina-qibīt-Anu		
A 3680	witness	3.IV.92 SE
YOS 20 62 (YBC 11633)	witness	13.[ ].100+ SE
BRM 2 33	witness	28.III.124 SE
Nanâ-iddin		
YOS 20 27 (MLC 2181)	witness	24.[ ].58 SE
Nidintu-Anu		
BRM 2 20 = YOS 20 34 (MLC 2178)	witness	20.VI.71 SE
YOS 20 42 (NCBT 1937)	witness	17.XII².85 SE
YOS 20 43 (MLC 2170)	witness	20.IV.88 SE
VAS 15 47	patronymic	20+.VII.120 SE
BRM 2 33	patronymic	28.III.124 SE
YOS 20 65 (NCBT 1936)	patronymic	8+.[ ].128 SE
YOS 20 66 (MLC 2187)	patronymic	[ ].[ ].128 SE
VAS 15 34	patronymic	2.XI.133 SE
FB 16 (1974) no. 8	patronymic	date lost
Šamaš-ittannu		
YOS 20 31 (MLC 2164)	witness	22.VI.67 SE

Generation 4

Anu-aḫḫē-iddin		
Anu-uballiṭ		
BRM 2 38	sellers in real estate sale	12.V.139 SE
Anu-ab-uṣur		
YOS 20 63 (MLC 2182)	witness	14.VII.123 SE
Anu-bēlšunu		
A 3685	beneficiary in quitclaim	6.VII.155 SE

Anu-zēr-iddin		
A 3685	land owner in property description	6.VII.155 SE
[. . .]-Nanâ		
YOS 20 65 (NCBT 1936)	guarantor in real estate sale	8+.[ ].128 SE
Anu-ab-uṣur		
VDI 1955/4 no. 3	buyer in real estate sale	20.XI.159 SE
Anu-aḫ-ittannu		
YOS 20 52 (NCBT 1971)	witness	3.IX.108 SE
OECT 9 42	witness	date lost
Anu-balāssu-iqbi		
A 3685	waiver of rights in quitclaim	6.VII.155 SE
Lābāši		
VAS 15 48	witness	17.V.102 SE
BRM 2 31	witness	18.IX.118 SE
VAS 15 32	witness	21.X.119 SE
BRM 2 33	witness	28.III.124 SE
Mukīn-apli		
YOS 20 66 (MLC 2187)	witness	[ ].[ ].128 SE
Tanittu-Anu		
YOS 20 69 (MLC 2197)	witness	18.[ ].138 SE
BRM 2 44	patronymic	25.II.154 SE
Anu-aḫ-iddin		
VAS 15 34	witness	2.XI.160 SE
YOS 20 78 (NCBT 2304)	land owner in property description	11.XI.160 SE
Anu-uballiṭ		
YOS 20 69 (MLC 2197)	witness	18.[ ].138 SE
Anu-zēr-iddin		
VAS 15 47	buyer in real estate sale	20+.VII.120 SE
YOS 20 65 (NCBT 1936)	buyer in real estate sale	8+.[ ].128 SE
YOS 20 66 (MLC 2187)	buyer in real estate sale	[ ].[ ].128
Mannu-iqabbu		
BRM 2 33	witness	28.III.124 SE
FB 16 (1974) no. 8	witness	date lost
Tanittu-Anu		
YOS 20 63 (MLC 2182)	witness	14.VII.123 SE

Generation 5

Kidin-Anu		
A 3685	witness	6.VII.155 SE
YOS 20 79 (MLC 2175)	witness	date lost

Anu-bēlšunu		
BRM 2 44	witness	25.II.154 SE
[. . .]-na		
YOS 20 77 (YBC 8955)	witness	[ ].[ ].159 SE

Old Babylonian Texts from Tell Harmal—And Elsewhere?

MARIA DEJONG ELLIS

I recently used the various groups of Old Babylonian texts excavated at, or attributed to, sites in the Diyala region[1] to discuss the techniques of archival reconstruction, the problems inherent in the nature of the available material, and the dangers of what we might call premature archival attribution.[2] Prosopographic analysis, textual classification, and examination of the physical shape of the tablets, sometimes used separately and sometimes in conjunction, are basic tools in the process of archival reconstruction. But in the first instance their employment results not in the rediscovery of ancient archives but in the identification of what probably were the components of such archives: text groups in which a single individual figures as the primary actor, or which document a single economic activity undertaken by various individuals. It is not always as easy to determine the logical extent of the administrative organization within which such individuals worked or such activity took place — in other words, to determine the nature of the archive-producing entity. Certainly the term "archive" is singularly inappropriate when applied to what are essentially files or dossiers of documents focussing on the activities of a single person or a single office, and we should abandon the use of the term "archive" in connection with such text groups, and instead refer to them as "dossiers" or even simply "groups." This stricture is especially applicable to some of the groups of texts now known from the Diyala sites.[3]

In recent years I have undertaken a prosopographic study of all available published and unpublished information for text groups of Old Babylonian date attributed to, or definitely

1. Over the past three decades a number of scholars have worked with a succession of archives deriving from, or attributed to, the western section of the Diyala area. The situation as it was known in 1955 was covered in detail by Rivkah Harris in "The Archive of the Sin Temple in Khafajah (Tutub)," *JCS* 9 (1955) 34-35. Since then the question has been discussed in the context of text publications from individual sites and reviews of those publications; for literature, see M. Ellis, "Notes on the Chronology of the Later Ešnunna Dynasty," *JCS* 37 (1985) 61 n. 2 and 62 n. 4. A brief overview of the available textual material as now known is given in the Appendix to my remarks in the 34e CRRAI (Istanbul); see next note.

2. "Old Babylonian Texts from the Diyala Region: Problems of Archival Reconstruction," 34e RAI, Istanbul, 10 July 1988; for details and documentation, see the proceedings of that meeting (in press).

3. See my remarks in the 34e CRRAI (Istanbul), and also Charpin's comments in his review of YOS 14 in *BiOr* 36 (1979 [pub. 1980]) 197, referring specifically to Simmons' "Harmal Archive E."

known to derive from, the Diyala area, to help establish the parameters of the various groups and to see how they interrelate, if they do.[4] The goal of the current stage of that work is to reestablish the ancient text conglomerates in so far as is possible, in order to provide an analytic description of them. I also take into consideration such information as is now available for the physical context of the record-producing institutions. I would like to take the opportunity here to enlarge the published corpus of texts in question, and to proffer some additional information that bears on the prosopographic argument. It is with pleasure that I dedicate this article to the memory of Abe Sachs who was among those who encouraged my early labors in the field of Diyala texts.

The fifteen texts presented here[5] are part of a group of nineteen texts[6] which the Oriental Institute of the University of Chicago purchased in 1933 from the Brooklyn antiquities dealer John Khayat.[7] The tablets are clearly attributable to the Diyala area.[8] When dated, they have dates of the later kings of Ešnunna. The shapes and palaeography of all texts can be associated with those known for texts from the sites in the western part of the area. Prosopographic evidence bears out this general connection. Where explicit parallels exist in sets of names (personal name plus patronymic, or the name(s) of related family member(s), the relationship is strongest with texts that belong to the group that has become associated with the site of Tell Harmal, and with the officially-excavated texts from that site.

The excavations at Tell Harmal yielded a large number of tablets dating to the first part of the Old Babylonian period, especially to the reigns of king Ibalpiel II of Ešnunna and his immediate predecessors. These tablets are associated with extensive architectural remains, but to date neither the majority of the tablets[9] nor the details of where they were found have been published. Such information as is available[10] associates texts found in the oldest Old Babylonian level (Level IV) with rulers named Ištašni, Sin-abušu, Šumaḫum, Waqrum, Immerum, and Ḫammidušur.[11] Level III introduces texts dated to Ipiq-Adad II of Ešnunna. Transitional III-II gives year names of Naram-Sin and Daduša (and Dannumtaḫaz[12]), while tablets found in Level II are primarily dated to Ibalpiel II of Ešnunna.

The textual material found in the earlier campaigns of the official excavations at Tell Harmal was initially studied by A. Goetze.[13] The subsequent attribution to Tell Harmal of a group of about 100 purchased texts belonging to the Yale Babylonian Collection[14] is directly associated with Goetze's initial study of the excavated material. S. D. Simmons used prosopographic information supplied by Goetze to conclude that the texts at Yale, many of which are dated to the reigns of kings of Ešnunna, but had earlier been assigned to various other sites,[15] should instead

4. The archival attribution and the prosopographic information uses, as a point of departure, the informational groupings originally established by Simmons for the purchased texts at Yale University now attributed to Tell Harmal. The prosopographic information available from them supplements that from the excavated—although as yet essentially unpublished—texts from Tell Harmal and all other published texts groups from the area. These include purchased "archives" of Ilšu-naṣir and his father Bur-Sin, generally attributed to Ishchali; the purchased and excavated texts that can be associated with the Kititum Temple of Ishchali and other architectural remains found at the site; the purchased "archive" of Nur-Šamaš, from an unidentified site; excavated texts published as belonging to the archive of the "Sin Temple of Khafajah"; and the excavated texts from Tell edh-Dhibaʾi, insofar as they are published. The prosopographic and other information pertaining to all this material, including the unpublished texts from the archive of the Kititum Temple and the excavated Harmal texts, has been entered into a computerized data base, and all personal names in the texts presented here were checked against that corpus. My work on the Diyala area texts was supported in 1986-87 by a fellowship from the American Council of Learned Societies, which is gratefully acknowledged.

5. I wish to thank J. A. Brinkman for permission to publish these texts, and his help in making the task a pleasant and productive one.

6. Of the other five, one is a Lipit-Ištar cone, one a fragmentary Ur III economic text, one carries a year date of the Isin king Bur-Sin, and two are Old Babylonian, but contain no distinctive prosopographic or other information that would assign them to the Diyala area. One of these texts carries a standard Babylonian month name of the "Nippur Calendar."

7. For texts purchased on the antiquities market, it is important to gather all available data bearing on the accession of the documents into collections, to parallel the archaeological information available for excavated texts. Information about the texts published here comes from the records of the Oriental Institute. It might be noted that the John Frederick Lewis Collection of the Free Library of Philadelphia also contains texts belonging with "Harmal B" and "Harmal C." Mr. Lewis acquired many of his texts from John Khayat, and corresponded with E. Messayeh concerning the acquisition of tablets. At present it is impossible to connect any of the correspondence with specific tablets. Messayeh is the source of many of the illegally-excavated Diyala texts which are now in the Iraq Museum, such as the Diyala adoption contract TIM 5 3. The Diyala adoption contract TIM 5 4, on the other hand, came from the Baghdad dealer George Khayat, from whom the Oriental Institute also purchased tablets (though none identified in the records as coming from the Diyala area). There is no record in Chicago of the name of the dealer who supplied the large group of Diyala tablets in the Oriental Institute Collection that are part of the "Frankfort Collection" (tablets numbered A.7628-7918), purchased in 1930 in Baghdad (Frankfort, OIC 13 [1932] 3-4 and 57 n. 4, and S. Greengus, *Old Babylonian Tablets from Ishchali and Vicinity*, Uitgaven van het Nederlands Historisch-Archaeologisch Instituut te Istanbul 44 [Leiden, 1979] p. 1 n. 2. For a recent accounting of the texts, see Greengus, *Ishchali*, p. 2 and nn. 7-9, and my comments in "The Archive of the Old Babylonian Kititum Temple and Other Texts from Ishchali," *JAOS* 106 [1986] 761 n. 13, where I noted that the Oriental Institute's records show that the Frankfort Collection contain 290 objects, not 390 a typographical error in Greengus' work). At the time I examined the records in Chicago, the detailed accession information for the "Frankfort Collection" could not be located, and I do not know from which dealer the texts were acquired (but see *JAOS* 106 [1986] 757f. n. 4, citing Greengus *Ishchali*, pp. 2-3 n. 9, where Messayeh and Samhiry are suggested).

8. Four of these fifteen texts (A.11831=11, 11838=10, 11839=9, and 11843=15) are mentioned as "Harmal" texts at the conclusion of Charpin's discussion of the Diyala archives and their prosopography, *BiOr* 36 (1979) 197, citing information supplied by M. Stol.

9. For a bibliography of published texts, see Ellis, *JCS* 37 (1985) 61 n. 2.

10. For the date formulas represented on the texts, see generally Taha Baqir, "Date-Formulae and Date-Lists from Tell Harmal" *Sumer* 5 (1949) 34-84 and pls. 1-2, and "Supplement" to the same in *Sumer* 5 (1949) 136-43; R. al-Hashimi, "New Light on the Date of Harmal and Dhibaʾi," *Sumer* 28 (1972) 29-33, especially his chart on p. 33, giving both rulers attested in the Harmal texts and contemporary information from other kingdoms; and Charpin, *BiOr* 36 (1979) 178. Many dates known from tablets found in the earlier levels at Tell Harmal are also known from Level V of nearby Tell edh-Dhibaʾi. Not all of these are attributable to specific rulers. In addition a number of year names are found on tablets which may also come from Harmal Levels III or IV. I have no certain information concerning findspot or level. Rulers in this batch to whom dates can be attributed with a fair degree of certainty are: Abimadar, Waqrum, Belaku, Warassa, Ḫammidušur, Bunutaḫtunila.

11. His name is variously written (Ḫ)ammidu/ašur.

12. Not mentioned in al-Hashimi's discussion in *Sumer* 28 (1972) 29-33, but see A. Suleiman, "Harvest Documents and Loan Contracts from the Old Babylonian Period," *Sumer* 34 (1978) 133 notes to text 65.

13. He made transliterations of a large number of documents, copied a number of these, and published both the legal texts known as the *Laws of Eshnunna* (AASOR 31 [New Haven, 1956]) and a group of fifty administrative letters (*Sumer* 14 [1958] 3-78 and pls. 1-24). It was through his good offices and with the kind permission of the authorities of the Iraq antiquities department and the Iraq Museum that I originally became involved in 1967 with studying documents excavated at the site. It is with gratitude that I have over the years since Professor Goetze's death been able to use his study notes and a number of finished autograph copies of the texts in publications treating materials found at Tell Harmal.

14. S. D. Simmons, "Early Old Babylonian Texts from Tell Harmal and Elsewhere," *JCS* 13 (1959) 71-93, 105-19; 14 (1960) 23-32, 49-55; 15 (1961) 81-83, where the texts are discussed in detail. Copies of the previously unpublished texts, together with an updated historical and documentary introduction were published in YOS 14 in 1978, as nos 1-75, 77, 80, and 350. Others had been identified as BIN 7 58 and 72-92, and TIM 3 123.

15. J. B. Alexander, who published the first group of these texts in his *Early Old Babylonian Letters and Economic Texts*, BIN 7 (New Haven, 1943), assigned them a provenience at Sippar (BIN 7, p. 4 and n. 6). Since then other sites have been suggested, including Ešnunna and Neribtum. See the literature cited by D. O. Edzard, *Die "Zweite Zwischenzeit" Babyloniens* (Wiesbaden, 1957), p. 164 n. 878.

be attributed to Tell Harmal.[16] Simmons identified a number of what he called "archives."[17] He defined these "archives" on prosopographic grounds. Thus Harmal A is characterized by the presence of the names Uqael and his son Warad-Tišpak. The texts date primarily to the reigns of Dannumtaḫaz and Ibalpiel II of Ešnunna, but also include at least one tablet from the time of Ipiq-Adad II.[18] Harmal B documents the activities of Gidanum son of Ipiq-Adad. Texts in this group overlap somewhat in time with those of Harmal A, but the bulk is earlier in date. The reigns of Ešnunna kings from Ipiq-Adad II through Naram-Sin, Dannumtaḫaz, and Iqiš-Tišpak[19] are represented. For these two text groups (I avoid use of the word "archive" for reasons which I explained in detail elsewhere[20]) Simmons gave the several names that Harmal A has in common with texts actually excavated at the site.[21] B was then attributed to Harmal on the grounds of the prosopographical overlap with A.[22] The time frame of these two groups correlates with the levels known as late III and II in the occupational history of the site. The texts included in Harmal C are earlier than those in Harmal A and B. As known to Simmons, they contained oaths by Ḫammidušur, while one was dated by a year name since ascribed to that king.[23] Simmons did not give a key name that provided the connection with Tell Harmal, but relied on the mention of the god Belgašer (known to be the chief deity of the ancient town) to relate the texts to Harmal.[24] Simmons attributed the remaining texts of the group to "archives" D and E, on the basis of the prosopographical connections that these texts show with one or more of the previously-defined groups A, B, or C—or none, in the case of E.

Simmons' seriation into groups was accepted by D. Charpin in his review of YOS 14. Charpin reassigned some texts within the various groups, primarily in the categories of group D, and brought up to date the list of names known from Harmal A that tie that group to texts excavated at the site.[25] There is no doubt that the prosopographic connections of the texts have been traced correctly in so far as is possible. As I have stressed, however, prosopographic analysis on this level

16. *JCS* 13 (1959) 71-74 under "provenience," restated in YOS 14 (1978), introduction pp. 2-3. Simmons' attribution of the texts to Tell Harmal has been generally accepted. See, for example, F. Reschid's comments in *Das Archiv des Nūršamaš und andere Darlehensurkunden aus der altbabylonischen Zeit* (Heidelberg, 1965), p. 17 and n. 2, and Charpin's in *BiOr* 36 (1979) 188-89 and 196-97. We might note here, parenthetically, that the questions of what constitutes good internal textual evidence for the attribution of place of origin of economic texts, and, similarly, for the identification of a modern site with an ancient onomasticon need much refinement. For the kinds of problems that can arise, see my comments in *JAOS* 106 (1986) 759 n. 10.

17. For a discussion of the published texts belonging to the larger group (which also includes TIM 3 123 and a tablet now in St. Louis [Freedman, "St Louis", no. 238]), and their attribution to the various "archives," see especially Charpin's review of YOS 14 in *BiOr* 35 (1979) 189 and 196-97. See also my comments in the proceedings of the 34e RAI (Istanbul), the remarks below, and the new lists of assigned texts and key names in the introductory section of M. Ellis, *Old Babylonian Documents and Letters Primarily from the Diyala Area in the Free Library of Philadelphia* (Philadelphia, University Museum, in press).

18. Archive definition: *JCS* 13 (1959) 71-72; its date: pp. 74-76 and 79-80. See now YOS 14 p. 3, and also my comments in *JCS* 37 (1985) 28-69 and 82-85 (which reiterate an opinion I first expressed in public at the Paris Rencontre of 1980), and D. Charpin, "Données nouvelles sur la chronologie des souverains d'Ešnunna," in J.-M. Durand and J. R. Kupper (eds.), *Miscellanea Babylonica: Mélanges offerts à M. Birot* (Paris, 1985) pp. 53-55.

19. For the description of the "archive," see Simmons, *JCS* 13 (1959) 72-73; for the dating, pp. 76-78 and YOS 14 pp. 2-3, supplemented by Charpin, *Mélanges Birot*, pp. 58-59 with previous literature.

20. "Archival Reconstruction," Comptes Rendus, 34e RAI (Istanbul) in press.

21. Simmons' key names: Šamaš-eli-ina-matim son of Apil-Sin; Ibni-Tišpak priest (i.e., *šangu*) of Belgašer; Tutub-magir son of Damqanum.

22. *JCS* 13 (1959) 72-73; Charpin gives the situation as known in 1979 in his review of YOS 14 in *BiOr* 36 (1979) 196-97. See also the discussion below.

23. *JCS* 13 (1979) 78-79; chronological relationships of all three "archives" (A-C) are on p. 81. For the assignment of the year name "year: Belakum died" to Ḫammidušur, see Charpin, *BiOr* 36 (1979) 189.

24. *JCS* 13 (1959) 73.

25. *BiOr* 36 (1979) 196-97.

does not result in archives, but in files or dossiers, which are smaller components of archives. In March 1987 I approached the problem in a different way, using the physical characteristics of the tablets themselves, including whatever evidence we have of scribal idiosyncrasies. That investigation, which involved looking at all tablets at the same time,[26] laid out in batches according to the prosopographical "files" that had been identified as Harmal A-E, resulted in the following observations: (1) there is a visible difference between texts in A and B, even those involving the same persons; (2) almost all the tablets in D3 (texts related to both A and B) can be assigned with certainty to either A or B on the basis of physical characteristics (this is borne out by tablet content); (3) many of the tablets in group E can similarly be assigned to one or another of the earlier groups; and (4) tablets in group C have a very distinctive shape and employ a very distinctive "archaic" palaeography, regardless of which scribe is associated with a tablet. This is not surprising since these texts are earlier; but it is not necessarily the shape we would expect to modulate into one which is essentially diagnostic for the later Diyala texts.[27] I have recently observed that the Harmal C texts resemble the contemporary documents excavated at Khafajah[28] in shape. Since I have seen neither a tablet excavated from the relevant early levels at Tell Harmal or Tell edh-Dhiba'i, nor photos of such tablets, the implications of this resemblance for the question of provenience is unclear. I will discuss the prosopographical evidence below.

The Diyala texts in Chicago published here conform to these general observations, as do those in the Free Library of Philadelphia. Texts belonging to Group C are immediately distinguishable. Those belonging to the general "Harmal/Diyala" ambience can be assigned to individual groups (A and B) only if seen together with texts definitely known to belong to one or another of these two groups.

Given all the considerations discussed here, I propose that the interests of future archivization are best served if we designate to which general group (Harmal A, B, or C) the texts belong. In other words, texts "related" to A, now in D1, should also be assigned to A, as should those texts of the erstwhile D3 category that in fact belong with A on the same grounds (common names, enhanced by common physical characteristics, and, to a certain extent, content). Similarly B should include also D2, and the relevant texts from D3, and so on.[29] Within each larger group, subfile designations can be used to reflect the primary actor, following, for example, the subdivisions of Harmal A used by Charpin: Harmal A1 = the file of Uqa-el, and A2 = that of his son Warad-Tišpak.[30] Texts within each group which cannot as yet be assigned to a subfile can be left with the general group designation. Texts in D3 that cannot, as yet, be assigned to either A or B for lack of comparable information could stay in the general "D" category (showing that they are at least potentially assignable to one of the known Harmal groups)—or could be put into a separate subfile in both A and B. The former would allow them to be isolated quickly. The latter would allow comparisons with a known group. Harmal "E" is in fact not "Harmal" at all. That category includes texts belonging to the general Diyala ambience that cannot as yet be assigned

26. I wish to express my heartfelt appreciation to W. W. Hallo and U. Kasten of the Yale Babylonian Collection for the gracious permission to undertake this task, and for the good humor with which sufficient table space was found to allow me to complete it.

27. For a picture of excavated texts associated with the upper levels of the site, see Taha Baqir, *Sha-du-pu-um*.ki: *Tell Harmal* (Baghdad, Directorate-General of Antiquities, 1959), figs. 7-8.

28. Published by Harris as being the archive of the Sin Temple of Khafajah/Tutub, *JCS* 9 (1955) 31-69, 91-105; copies by Th. Jacobsen, pp. 70-88 and 106-120.

29. Problems of space dictate that such a list, updated to include all information now available or soon to be so, cannot be included here. It will be found in the introductory section to my volume for Diyala texts in the Free Library of Philadelphia.

30. *BiOr* 36 (1979) 196.

to any known group, and may come from any known site, including Harmal. An updated list of these designations, using the various criteria described here, will be found in my volume of Diyala texts in the Free Library of Philadelphia.[31]

Of the fifteen texts published here, four (Texts 1-4) can immediately be assigned to Harmal C, based on both tablet shape and content. Texts 1 and 2 are both real estate sales[32] and refer to the same transaction—or at least transactions involving all the same persons. The buyers are not the primary actors known from other sales documents in Harmal C (Nuratum and Anakuilama sons of Paratum), but the texts have names in common with other texts of this group, including several witnessses and the scribe.[33] Texts 3 and 4 are both case fragments, showing only the remains of a witness list. The same names occur on both, as well as on a number of published texts that are part of Harmal C or closely related to it.[34] However, the names do not occur in the same order. Since both witness lists are case fragments, they are given separate text numbers here, although they share a single collection registration number. The scribe of Text 3 is also known from other texts associated with Harmal C.[35] There are still no certain connections (such as the identity of both name and patronymic) between texts associated with Harmal C and the texts actually excavated at the site. The possible implications of this will be touched on later.

The remaining texts have a variety of possible attributions.[36] Texts 6 and 12 share names with the excavated texts and with Harmal B (Text 6 belongs to the dossier of Gidanum himself). Text 8 has definite prosopographical connections with Harmal A and the excavated texts. Texts 7 and 11 tie in with the excavated texts and both Harmal A and B.[37] In addition both share persons with the Ilšu-naṣir "archive." That text group is generally thought to come from Ishchali, on the basis of dealers' statements, but has no traceable connection with that or any other site—except for the relationship now observable in our two texts. Texts 4, 9, 10, 13, 14, and 15 name no distinctive persons known from other groups.

31. Problems of space keep me from including it here.

32. The clauses of these documents are discussed in detail by Simmons, *JCS* 13 (1959) 88-92, supplemented by his comments in YOS 14 p. 5.

33. See the list in the introduction to Ellis *Diyala FLP*.

34. For example, Ellis *Diyala FLP* nos. 120 and 124 (FLP 1403 and 1407), both of which record field purchases made by Nuratum and Anakuilama, show the name of the witness Samukiel son of Maruliel, as do YOS 14 27 and 29 (and, without the patronymic, but clearly referring to the same person, YOS 14 30, 32,58).

35. See the entry under *Me-ra-lí* in YOS 14, citing YOS 30 and 37, both belonging to C. I prefer to read the name *Me-ra-ni*, given the fairly common occurrence in the Diyala area texts of the name written as *Me-ra-nu-um*.

36. Several of the texts show a scribal characteristic which may or may not turn out to be a criterium for grouping. They have a line, not only at the end of the text (not uncommon in other texts, especially if the inscription finishes well before the end of the space available on the tablet), but also when the end of the space available on any one surface is reached. Text 5 (Naram-Sin date, no text group attribution) has rules on the obverse, reverse, and upper edge; Text 6 (Naram-Sin, Harmal B) on the obverse and lower edge, but not on the reverse or upper edge); Text 11 (Ibalpiel II, no attribution) obverse and reverse; Text 13 (no date, no attribution) obverse and reverse; Text 15 (no date, names in common with both Harmal A and B) obverse (the reverse is missing).

37. If a text shows connections with more than one group, without indicating which of the relationships might be primary, it cannot be readily assigned to either group, unless it is physically possible to compare the shape of tablet with the texts at Yale.

Seven texts (nos. 5-11) are dated, to years of Naram-Sin, Dannumtaḫaz, and Ibalpiel II.[38] Two of the year names are new, adding an additional year each to those previously known for Naram-Sin[39] and Dannumtaḫaz.[40]

Text 5: mu alam kù-gi ^{md}*na-ra-a*[*m-*^{d}*sin*]; month: Kinunim/Kinunu; Naram-Sin year "m."

Text 6: mu ^{d}*na-ra-am-*^{d}*sin* ^{giš}gigir *ni-ki-il-tim ú-še-ri-u*; no month name; Naram-Sin, new year name.

Text 7: mu bará-maḫ ^{d}niraḫ *d*[*a-a*]*n-nu-um-ta-ḫa-az*; no month name; Dannumtaḫaz, new year name.

Text 8: mu alam kù-gi ka-[. . .] ^{m}*i-ba-al-pi-el*; no month name; Ibalpiel II, new year name or new variant of year 7.[41]

Text 9: mu *ra-pí-qum* [. . .]; no month name; Ibalpiel II year 9.

Text 10: mu erín su-bir$_4$ ḫé-an-na ^{giš}tukul ba-sìg (tablet lines 5, 20); month Abu, day 1; Ibalpiel II year 10, variant of year name, with the writing ḫé-an-na for the usual ḫé-na(.ki). Charpin and Durand have now identified that geographical name as Ḫena (written *ḫe-en*.ki in unpublished texts in Damascus),[42] rather than as Ḫana, as had been previously assumed.[43]

Text 11: mu apin kù-gi; month Saḫaratim, day 20; unassigned year of Ibalpiel II (Baqir no. 34).

The topics covered in the texts include loans (nos. 6, 13),[44] accounts (nos. 11, 14), silver (no. 15), grain received (no. 10), a boat (no. 5), small cattle (no. 9), and familial relationships (nos. 7, 8, 12). Text 7 is a list of gifts made to a woman by her father, mother, and brother. A woman of the same name, Ḫumtani, is known from FLP 2289 (Ellis *Diyala FLP* no. 14) as the donor of a silver necklace to the Kititum Temple, but no evidence proves definitively that the two are the same. Her name would be the only one in our Text 7 that occurs in the Kititum Temple material. Texts 8 and 12 record adoptions. Text 12, a case fragment, in so far as it is preserved shows the same text as does YOS 14 47, involving the same people. Quite a few adoption texts were excavated at Tell Harmal, and a further five are now published from purchased collections attributed to the site.[45] I discussed the formulary of the contracts in detail some time ago.[46] It should be noted that in Text 12:9 the second sign of the verb in the penalty clause is *ša*, suggesting the reading *ú-ga-la-bu-ma* of YOS 14 47:12. However, it is possible that the scribe intended *ga*, since it should be noted that the penultimate sign of Text 5:10, which clearly should be read as *ga* also looks like *ša*.[47]

38. For references to dates attributed to these kings, see Ellis, *JCS* 37 (1985) 63 n. 7. Dates are designated by the numbers or sigla given them in Baqir, *Sumer* 5 (1949) 39ff., or in Simmons, *JCS* 13 (1959) 76-77 and 82 (for Naram-Sin).

39. On Naram-Sin's reign, its length, and the years to be ascribed to it, see Charpin, *Mélanges Birot*, pp. 57-62, especially pp. 58f., citing previous literature and interpretations.

40. For previously-known dates of Dannumtaḫaz, and for other information affecting the chronology of his reign see Ellis, *JCS* 37 (1985) 61-85.

41. For years designated by the phrase alam kù-gi, see Ellis, *JCS* 37 (1985) 73-79; almost all the examples given there belong to Dannumtaḫaz, not Ibalpiel II.

42. "La prise du pouvoir par Zimri-Lim," M.A.R.I. 4 (1985) 307 n. 70.

43. See B. Groneberg, *Die Orts- und Gewässernamen der altbabylonischen Zeit*, RGTC 3 (1980) 88-89.

44. For the types and the phrases that occur in loans from Harmal, see Simmons, *JCS* 13 (1959) 83-88, and YOS 14 pp. 4-5.

45. TIM 5 3 and 4, YOS 14 47, and the two texts published here. Additional adoption contracts excavated at Harmal also exist.

46. *JCS* 27 (1975) 130-51.

47. The *ga* of YOS 14 47:12 is confirmed by collation. The texts in Chicago were collated for me by J. A. Brinkman, who confirms clear verticals in both 12:9 and 5:10.

In surveying the prosopographical information available for the various Diyala texts in order to try to place the texts published here, several interesting points came to light.[48] First, there are still no certain prosopographical connections between texts assigned to Harmal C and texts officially excavated at the site of Tell Harmal. Secondly, there are no connections between the texts belonging to the dossiers of Ilšu-naṣir and his father Bur-Sin and those that were excavated at the site of Ishchali, to which the two dossiers have been attributed on the basis of dealers' statements. However, we now have at least two persons who are mentioned in those text groups and who are also attested in one or more of the Harmal groups A, B, or the material excavated at Harmal.

It should be noted that the overlap between the various text groups, including the excavated Harmal texts, occurs only among the "secondary" characters. The relationship is chiefly with the witnesses to various transactions and legal proceedings, and not the principals. What this means is unclear. The seriation that has been established is essentially one of text groups rather than archives. That may mean that the archival distinctions that apply to these texts—if and when we come to know them—may turn out to cut across different lines. Part of our problem is created by the lack of definitive knowledge concerning the provenience of many of the texts. But we should also be aware that even though we may know the exact provenience of the excavated texts, this does not necessarily give us certain knowledge concerning the site of origin, let alone the nature and identity of the ancient record-producing authority. We can try to determine some of this by prosopographic analysis, and by physical examination of the documents. But the difficulty transcends this level. We also are ignorant of the nature and identity of the ultimate ancient archival authority. This affects the degree to which prosopography can be used to reconstruct the archives, and ultimately the degree to which these texts can be interpreted. Meanwhile, there are many questions. For example, what is indicated by an overlap of persons between text groups such as excavated materials from Harmal and the groups known as Harmal A and B (represented by Simmons' Harmal D3)? It could merely mean that both were produced locally by distinctly different agencies, yet drew on the same population group for potential witnesses and actors or subjects. But then what does it mean when the same persons are mentioned in texts that were excavated at Tell Harmal and the so-called archive of Ilšu-naṣir? Is the attribution of the latter to Ishchali to be questioned? Did the subjects move around? Or was the tablet written in one place and sent elsewhere to be kept? Another interesting problem is that a number of the Harmal adoption contracts have witnesses in common with each other, but with no other texts. Does this imply that the adoptions were executed elsewhere, but the records stored at Harmal? I cannot in the present state of our knowledge resolve these questions, intriguing though they are. Their solution must await the discovery of further information and future insights.

48. My remarks are limited to observations that affect the texts mentioned here. Reasons of space preclude more elaborate detail, for which see the introduction to my volume of Diyala texts in the Free Library of Philadelphia.

CATALOGUE OF TEXTS

1. A.11833. 88×52×26 mm.; parts of all four edges preserved, but most of lower edge gone. Inscribed on both sides and lower, upper, and left edges. Not dated. Harmal C, on the basis of the scribe's name, Apil-Kubi. Typical Harmal C shape and script. Real estate transaction. Appears to refer to same transaction as no. 2 (A.11835).

2. A.11835. 62×44×19 mm.; reverse almost completely gone. Harmal C. Real estate transaction. Appears to refer to the same transaction as no. 1 (A.11833).

3. A.11845a. 41×44 mm.; case fragment. Harmal C, on the basis of the scribe's name (Merani, who also wrote YOS 14 30 and 37), and the witness Samukiel son of Maruliel. List of witnesses; some of the names also occur in no. 4, but in different order.

4. A.11845b. 50×47mm.; case fragment. Harmal C, on the basis of the witness Samukiel son of Maruliel. List of witnesses; names also occur on no. 3, but in different order.

5. A.11841. Tablet and fragmentary case. Tablet measures 78×47×25 mm.; upper right edge, lower edge, and most of top of reverse gone. Inscribed on both sides, and lower, upper, and left edges. Case in 6 fragments; main pieces show end of reverse and upper edge (date). Case is sealed on left edge, with seal of Abijatum son of Sin-puṭram servant of Naram-Sin, rolled three times; his connection with the transaction is unknown, since the reverse of the tablet is damaged. Archival attribution uncertain; similar names are known from the various "Harmal" groups. Dated on both tablet and case to Naram-Sin of Ešnunna, year: mu alam kù-gi ^{md}*na-ra-a*[*m-*^{d}*sin*] (shortened form of year "m": alam kù-gi *ša* RN *a-na* é ^{d}*Tišpak i-ru-bu*), month Kinunu/Kinunim. Transaction concerning a boat, possibly belonging to the palace (case, line 1). The script on the case is much more archaic-looking than that of the tablet (see alam, ra); this has implications for arguments of attribution or dating based on "isographs."[49]

6. A.11840. 65×42×28 mm.; center right part of the reverse is gone. The tablet is not sealed; it may originally have had a case (case-type break; small accretion on the upper edge). Harmal B; the personal names occur in texts dated to the reigns of Ipiq-Adad II, Naram-Sin, and Dannum-taḫaz. This text is dated to Naram-Sin: mu RN ^{giš} gigir *ni-ki-il-tim ú-še-ri-bu* (new date, adding an additional year to Naram-Sin's reign), Month *níg-gal-lim*, day 2. Loan of barley and silver, both *ḫubuttatu*, from Gidanum.

7. A.11844. 99×48×29 mm.; inner tablet, missing its upper left corner and lower right corner. The tablet was sealed before the text was added. One seal with incised legend, three figured seals, labelled. Three of the seals are those of witnesses; one is not attributable. Persons named in this text are known from excavated Harmal texts, and from both Harmal A and Harmal B: Ibni-Tišpak; Iltani, wife of Inbi-Ištar; Awil-Amurru son of Kubutum; Gidanum the merchant (all excavated, and B); Sin-naṣir son of Sin-eribam and Zimi-Šamaš-lumur (excavated and A). This text is dated to a previously unknown year of Dannumtaḫaz: mu bará.maḫ ^{d}niraḫ RN. The only other attestation in Diyala-area texts of the recipient's name, Ḫumtani, is found on FLP 2289 (Ellis *Diyala FLP* no. 14), a Kititum Temple text. None of the other persons mentioned in our Text 7 can be distinguished in the Kititum Temple archive, so it is quite likely that the Ḫumtani who receives the gifts is not the same person as she who is listed as a donor of a silver necklace in the Kititum

49. For an attempt to use the writing of the sign *ú* in Diyala texts to date the tablets, see Charpin, *Mélanges Birot*, p. 55, with a stricture concerning the dangers of such analysis in n. 35 (the "archaic" *ú* of the Naram-Sin texts he discusses is also found in an Ibalpiel II document).

Temple text. However, that text is also dated to Dannumtaḫaz, and it is always possible that the two texts do in fact refer to the same person. We unfortunately do not know the relationship in which the persons who gave gifts for Kititum stood to the temple and its hierarchy, or where they were domiciled.

8. A.11842. 96×52×34 mm., measurements for tablet, not including adhering case piece; other case fragments are separate. Part of the upper edge and the adjacent area of the obverse are missing, as is most of the right edge. The tablet is sealed: two different seals are labelled on the lower and upper edges; one seal with legend is rolled twice on the left edge, as well as in the reserved space on the left edge of the case; the obverse and reverse of the tablet are covered with a fleetingly impressed cylinder seal, probably rolled before the text was entered. Because most of the witness list on the reverse is obscured by a flake of the case, the seals cannot be definitively connected with individuals mentioned in the document. Persons in this text are also mentioned in excavated texts from Tell Harmal and in Harmal B and A; one, Sin-išmeanni son of Sin-dajjan, occurs in excavated texts from Tell Harmal and in the "Ilšu-naṣir archive from Ishchali." Adoption contract, oath, probably by Ištar (MUŠ, which often, however, is used as a shorthand indication for MÚS, Tišpak) and Ibalpiel. The text is dated to Ibalpiel II, either year 7 (new variant[50]) or a new year name: mu alam kù-gi ka-[. . .] ^{m}RN.

9. A.11839. 50×40×25 mm.; almost complete, part of right obverse and adjacent upper edge gone. Sealed, on the lower edge with an uninscribed unidentified figured seal (or seals), on the left edge twice with the seal of Nannatum son of Sin-remeni, who is the last-listed witness. Gurrudum son of Ili-išmeanni, a witness in this text, occurs in excavated texts from Tell Harmal, in Harmal A, and in the "Ilšu-naṣir archive from Ishchali"; Nannatum son of Sin-remeni is known from excavated texts and Harmal A. Like those texts, this one is dated to Ibalpiel II's 9th year: mu *ra-pí-qum* [ ]. Account concerning small cattle.

10. A.11838. 77×64×32 mm.; tablet almost complete, part of lower edge gone at right. Names occur in excavated texts from Harmal dating to the time of Ipiq-Adad and Naram-Sin, and in Harmal A. Dated to Ibalpiel II's 10th year: mu erín su-bir$_4$ ḫé-an-na[51] ^{giš}tukul ba-sìg (line 5); month Abu, day 1. Receipt of grain, níg.šu *awīlim*, of *maš-kán*-an-za-qàr.ki.

11. A.11831. 49×39×25 mm.; left edge damaged. Sealed on lower edge with the seal of the first witness. No decisive prosopographical evidence for attribution to any particular text group. Dated to Ibalpiel II, year ? (Baqir's date no. 34[52]): mu apin kù-gi, month Saḫaratim, day 20. Settlement of account between two individuals, Šamaš-bani and Riš-Adad.

12. A.11846. Fragmentary case, main fragment 66×40×6mm.; one of the case fragments stored with A.11842 (Text 8, above) was subsequently recognized to join this text at the right edge. Harmal B. Three rollings of a figured seal on the reserved space at left; the third impression might be that of a different seal: the head of a dingir-sign shows. Fragment of adoption contract involving the same people as YOS 14 47. Our text might be case of that tablet, or of a duplicate text.

13. A.11829. 88×48×25 mm.; lower right corner of tablet damaged. No distinguishing prosopographic evidence; similar names are known from excavated texts from Tell Harmal, and Harmal A and B. Not dated. List of loans given to various individuals.

50. For a list of excavated forms, see Baqir, *Sumer* 5 (1949) 65f. and 80, no. 27.

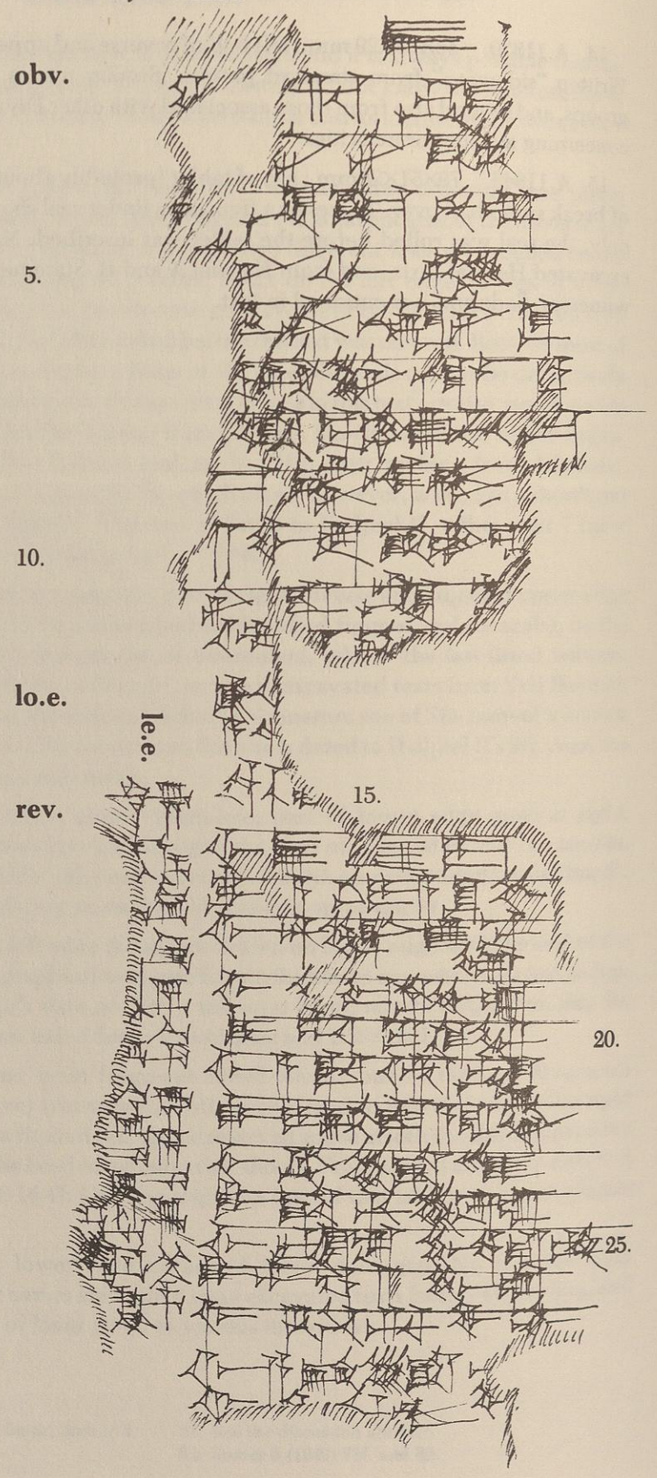
51. See the discussion above.

52. *Sumer* 5 (1949) 73f. and 82.

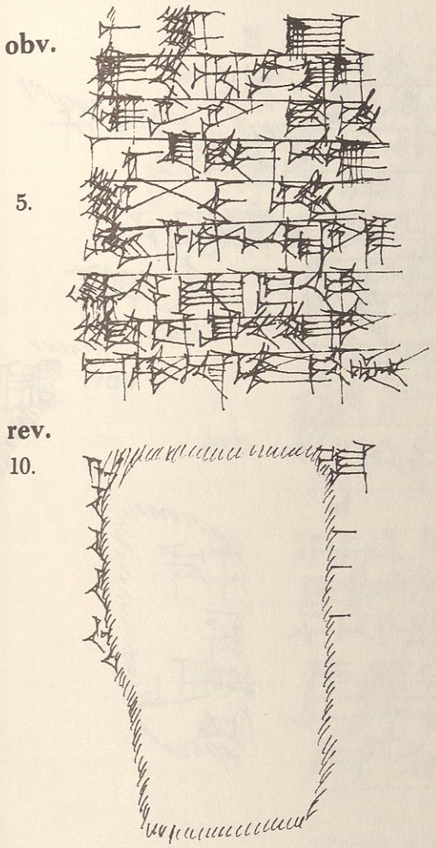
14. A.11830. 48×73×29 mm.; left half of reverse and upper edge missing, obverse damaged. Written "sideways" from standard pattern. Similar names are known from all Harmal text groups, and several also from those associated with other Diyala area sites. Not dated. Statement concerning account or activities.

15. A.11843. 70×51×26mm.; top of tablet (probably about 2/5 of the total length) gone, edge of break smoothed over. Traces of a figured cylinder seal show in upper right corner of reverse, only; the seal was rolled before the tablet was inscribed. Names in this text are known from excavated Harmal texts, and from Harmal A and B. Statement concerning silver, made before witnesses. Šaduppu is mentioned in text.

1. A.11833

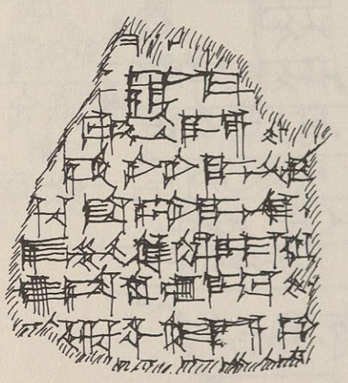


2. A.11835



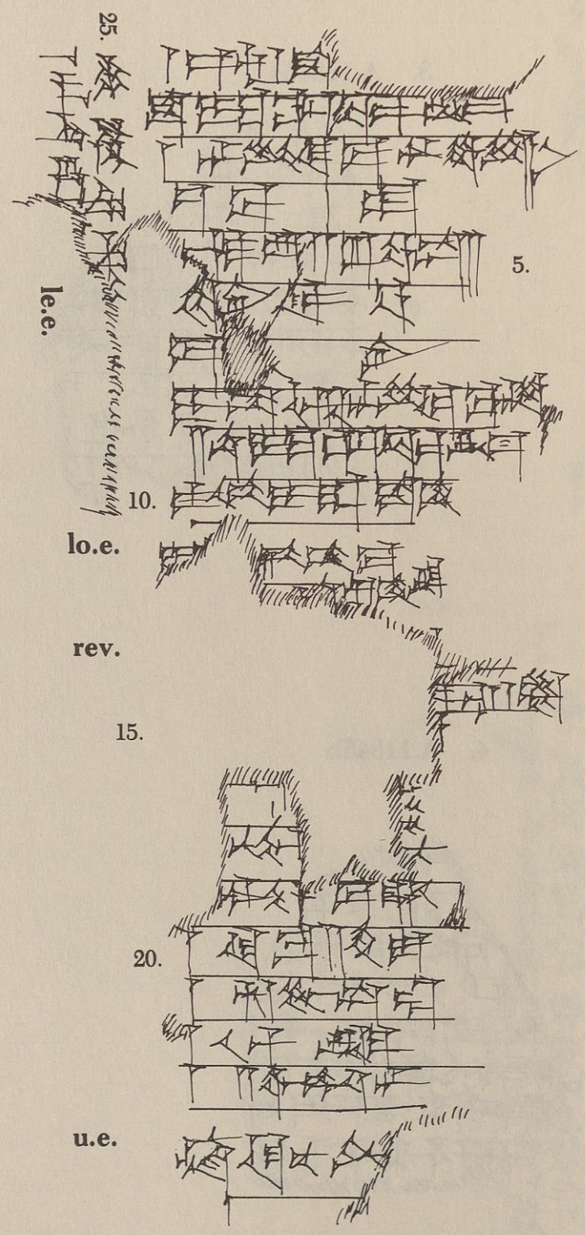
3. A.11845a

4. A.11845b

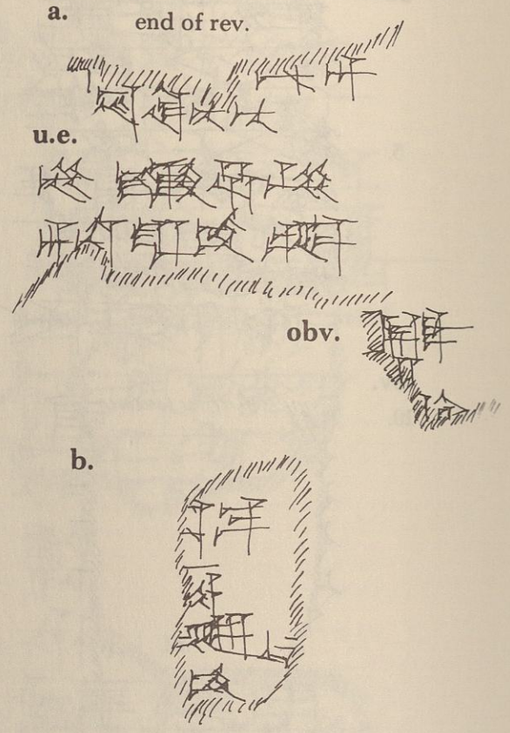


5. A.11841

TABLET



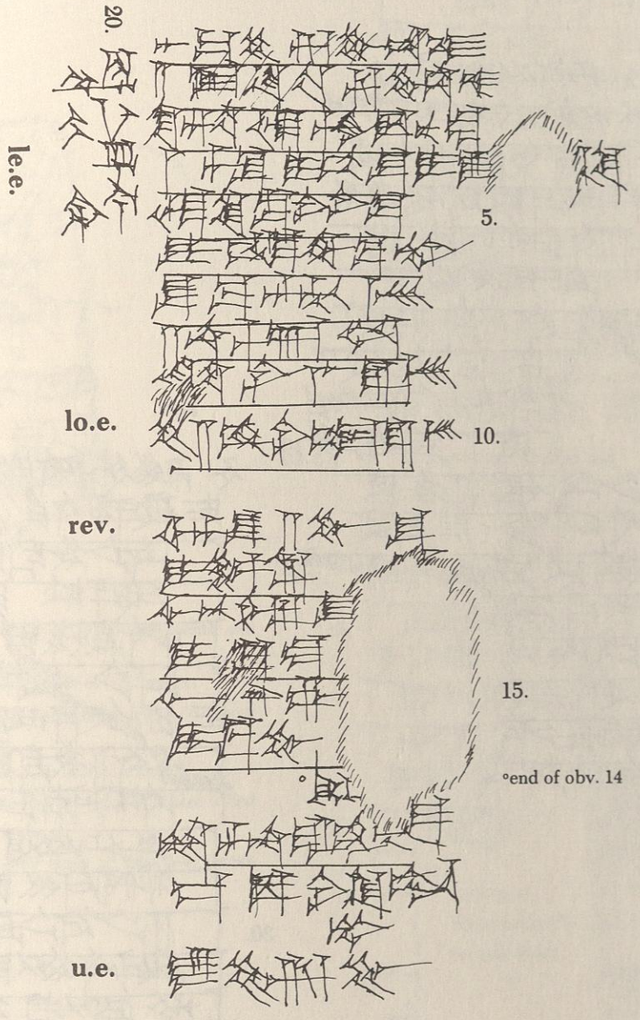
CASE



CASE: six fragments; only a and b are copied
—a. upper edge of case showing lines from the obverse, the end of the reverse, and the upper edge.
—b. flake showing ends of obv. lines 8-10.
—c. left edge with remains of seal impression, rolled three times:
a-bi-ja-tum
dumu ^{d}en.zu-*pu-uṭ-ra-am*
ìr *na-ra-am*-^{d}en.zu.
—d. small fragment, center of obv. lines 7-8.
—e. small unplaceable fragment, with three signs.
—f. uninscribed sliver.

6. A.11840

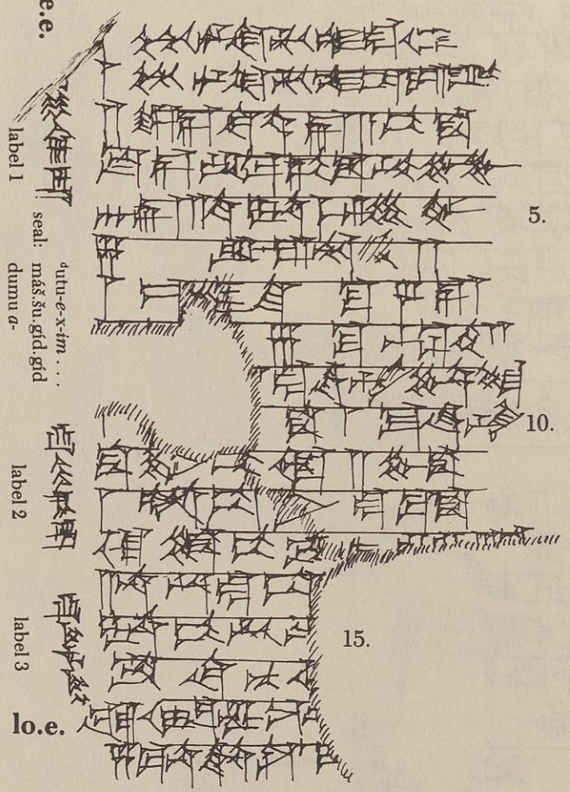
obv.



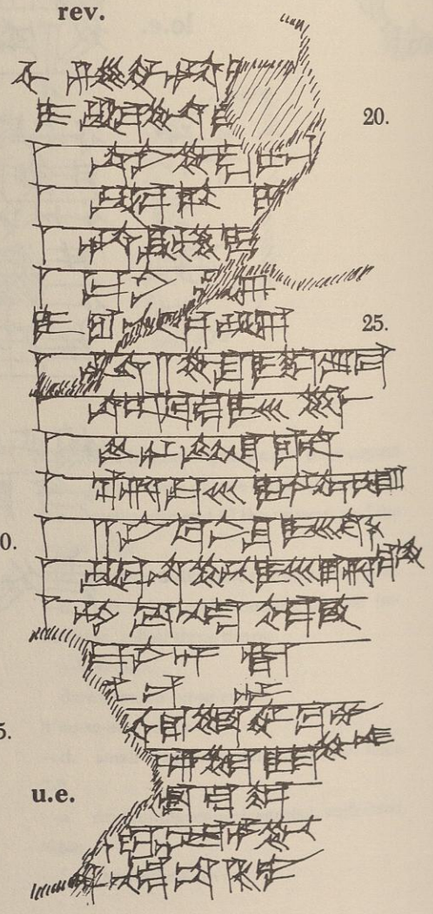
7. A.11844

figured seal rolled all over tablet before inscribing

obv.



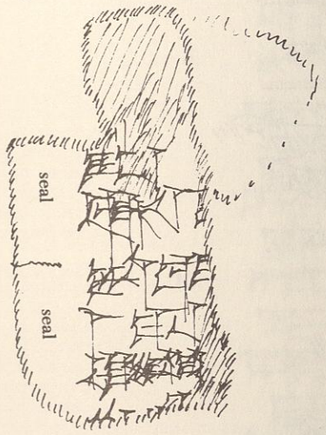
rev.



8. A.11842

CASE

"c"



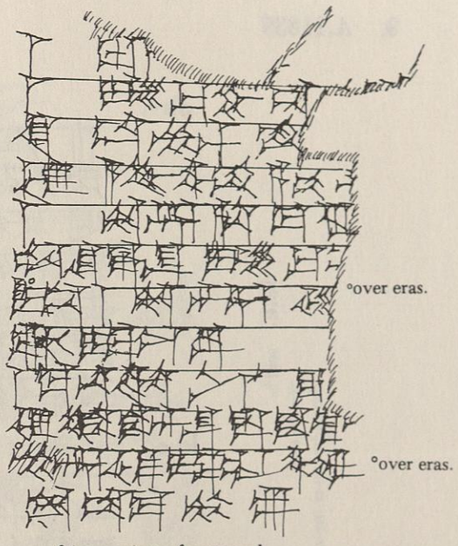
CASE: two loose (a + b) fragments, not copied

—a. parallels obv. lines 5-6, center.

—b. probably joins case flake (c), now stuck to tablet.

—c. flake stuck to tablet reverse shows:
a) same seal as left edge of tablet, rolled in reserved space
b) first few signs of lines 5-9, shown above.

obv.



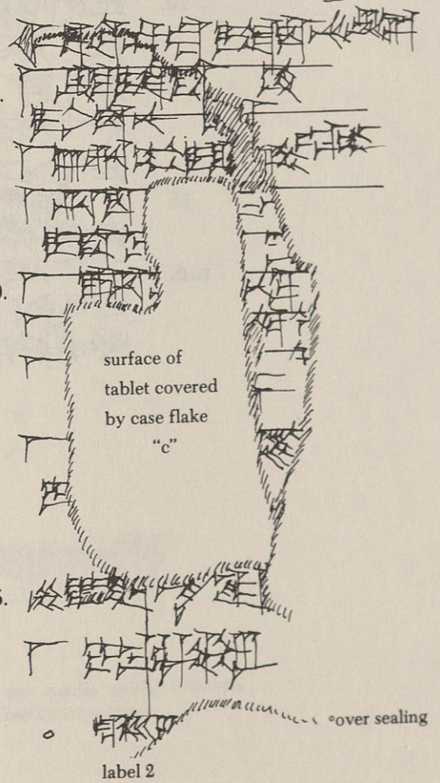
lo.e.

2 impressions of same seal

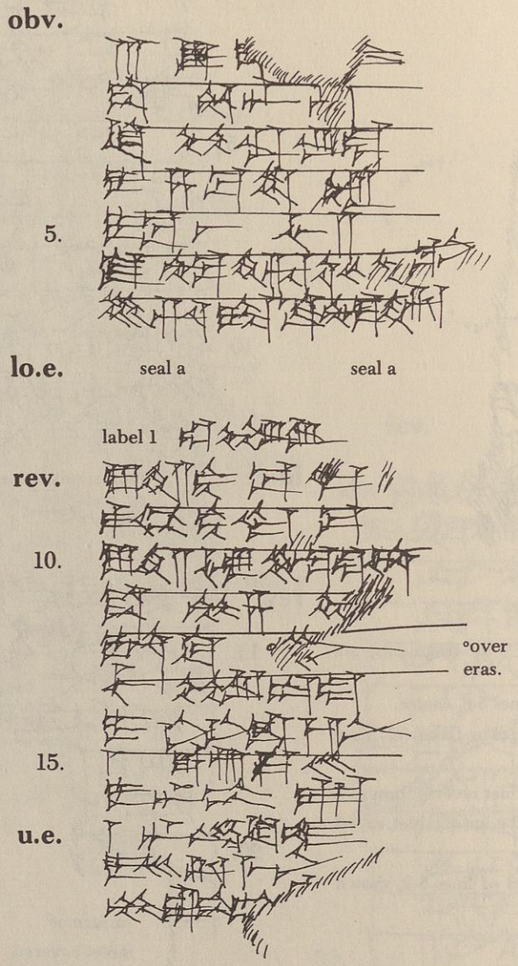
label 1

e-ri-ba-
dumu
ìr *ša* dEN.ZU

rev.

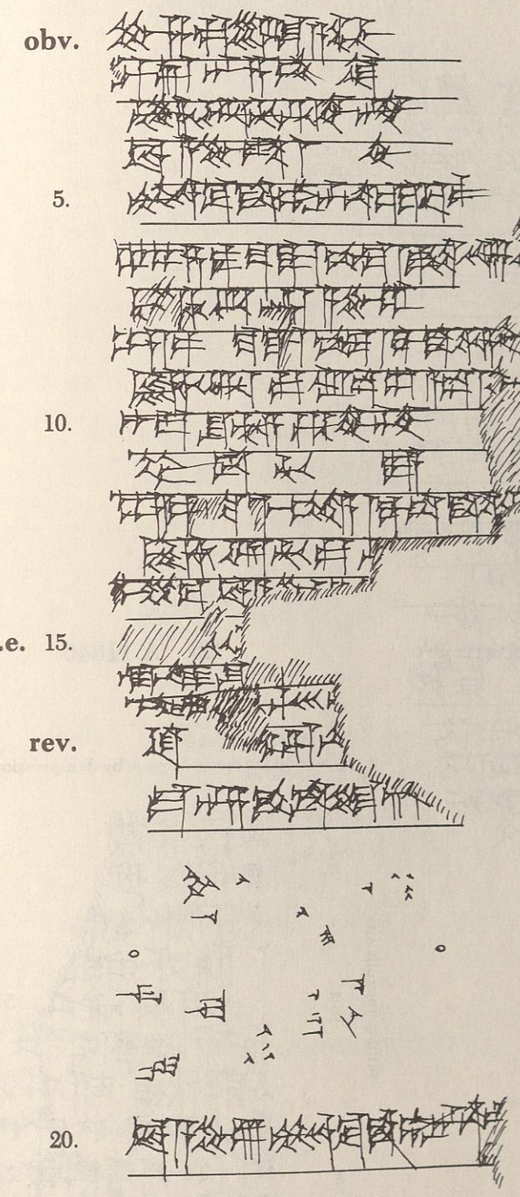


9. A.11839



le.e. seal b:
dšeš.ki-tum
dumu den.zu-ri-me-ni

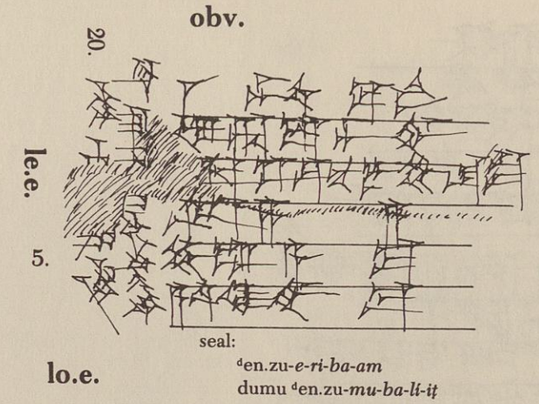
10. A.11838



° °"blank" section of reverse carries erased notations oriented sideways to the direction of writing

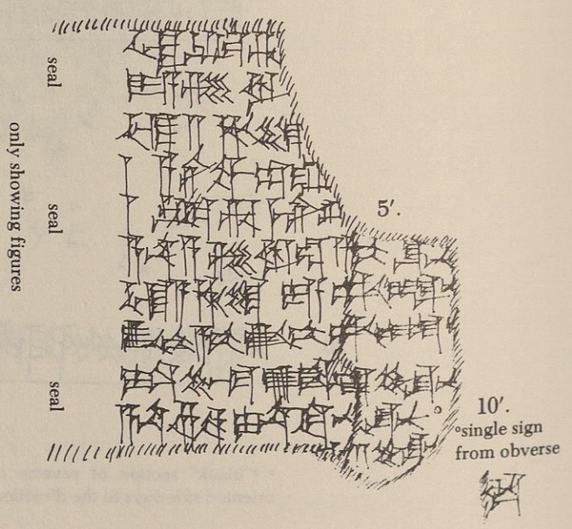
11. A.11831

obv.



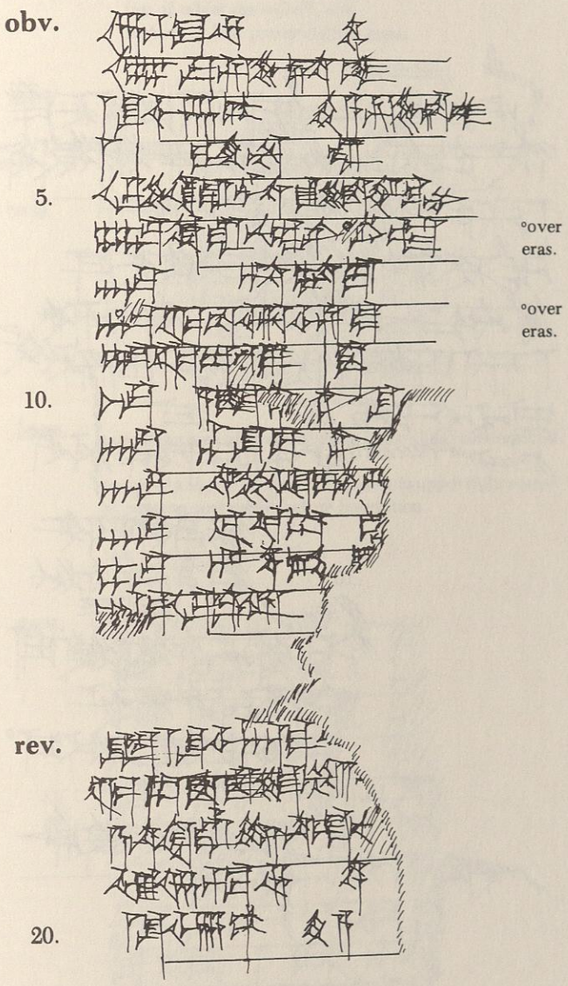
12. A.11846

CASE: two flakes
sealed in reserved space by 3 impressions of figured seals



13. A.11829

obv.

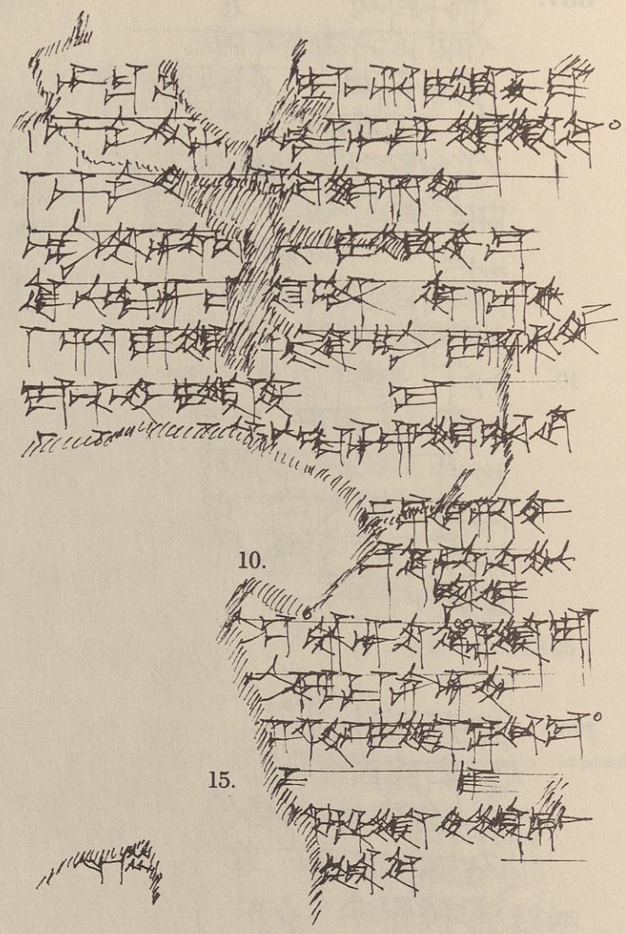


remainder of reverse uninscribed

not sealed

14. A.11830

obv.



°see below at reverse

lo.e.

rev.

°eras. ° °overwritten

signs from obv. and rev. somewhat superimposed

u.e.

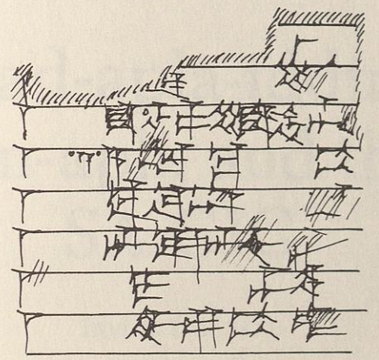
15. A.11843

probably ca. two-fifths gone;
top of tablet shaved off, and
surface of first preserved line gone.

obv.

°eras.

° °eras.

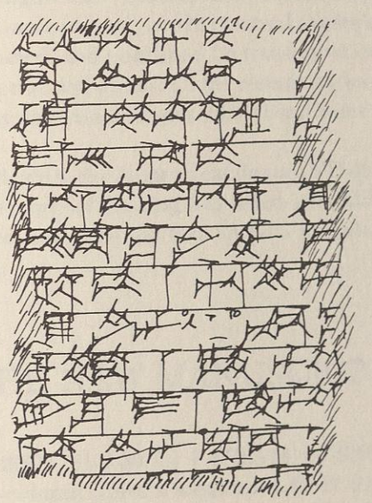


lo.e. remaining area of obverse (space for one line) not inscribed

traces of a figured cylinder seal show in upper right corner of reverse; seal rolled before inscription

lo.e. probably not inscribed

rev.



traces of a figured cylinder seal are visible in the upper right corner of the reverse

seal rolled before inscribing

Adad-apla-iddina, Esagil-kīn-apli, and the Series SA.GIG

IRVING L. FINKEL

In 1956 J.V. Kinnier-Wilson published a recently discovered piece of a Nimrud tablet that contained part of a catalogue to the medical omen series SA.GIG.[1] A broken section of that tablet describes the role played by a significant redactor, Ešguzi-gin-a, but the name of the king under whom he worked is broken ([d]X-apla-iddina), and has proved a point of discussion.[2] Subsequently, the same scholar identified, joined, and published (in transliteration only) the remainder of the Nimrud tablet.[3] The new piece added almost all the remaining incipits to SA.GIG, and added similar information for the physiognomic omen series Alamdimmû, Kataduggû, and associated texts.

The identification of a duplicate to the Nimrud catalogue (ND 4358+4366) in BM 41237+ now establishes for certain that the name of the king was Adad-apla-iddina, gives fuller information about the editing of the series, and adds the few SA.GIG incipits that were previously either broken, or altogether missing.

THE NEW MANUSCRIPT

BM 41237 (81-4-28,785) + 46607 (81-8-30,73) + 47163 (81-8-30,685)[4] represents slightly more than the lower half of a single-column tablet; it measures 7.4 × 11.0 (at maximum) × 1.8 cms., and there seems every likelihood that when complete it contained the same material as did the

1. See *Iraq* 18 (1956) 130-146.

2. Marduk-apla-iddina was suggested in *Iraq* 18 (1956) 136; W. G. Lambert proposed Nabu-apla-iddina in *JCS* 11 (1957) 6; J. A. Brinkman opted for the same in *JCS* 16 (1962) 96 sub 24.3.3; compare also *Studies Presented to A. Leo Oppenheim* (Chicago, 1964), p. 37. J. J. A. van Dijk later showed (Vorläufiger Bericht über die von der Notgemeinschaft der Deutschen Wissenschaft 18 [Berlin, 1962], p. 51) that the king should be Adad-apla-iddina of the Second Dynasty of Isin (1067-1046 B.C.); see also J. A. Brinkman, *A Political History of Post-Kassite Babylonia 1158-722 B.C.*, AnOr 43 (Rome, 1968), p. 141. For the reign of Adad-apla-iddina see recently C. B. F. Walker, in G. van Driel *et al.*, eds., *Zikir Šumim* (Leiden, 1982), pp. 398-417.

3. *Iraq* 24 (1962) 52-62.

4. BM 46607 and 47163 were joined by C. B. F. Walker in 1977; BM 41237 was joined and the text identified by the present writer

Nimrud tablet ND 4358+4366. The 81-4-28 and 81-8-30 collections of the British Museum both consist of tablets brought to England by Hormuzd Rassam[5]; the provenances are stated in the Department Registers to be Babylon for 41237 and 46607, while 47163 has no provenance quoted. The script is Babylonian, small and neat, and probably Neo-Babylonian rather than later; the sign forms are not dissimilar from those in many tablets in a Babylonian hand from the libraries at Nineveh. A copy of BM 41237+ is given below as Fig. I.

THE EDITORIAL WORK ON SA.GIG

The authorship of the medical and physiognomic omens was anciently attributed to Ea,[6] but it is evident that by the turn of the second millennium BC a proliferation of tablets, recensions and variants required a firm human editorial hand; and in the remarkable passage studied below (already partly known from ND 4358+) we are informed that order was brought to bear on the problem by one Ešguzi-gin-a.

The name of this scholar-scribe is well-known. The Akkadian equivalent to his name (written ^{m}èš-gú-zi-gi-in-a) is given in VR 44 iii 44[7] as ^{m}*é-sag-gíl-ki-in-ap-li*, and he is also listed as one of the famed official *ummānū*, "(chief) scholars," in W 20030,7, the Seleucid *List of Sages and Scholars*[8] in the following context:

16 [*ina tar-ṣi* ^{m}x-x]-x LUGAL ^{m}*é-sag-gil-ki-i-ni*-DUMU.NITA *um-man-nu*
17 [*ina-tar-ṣi*] ^{md}IM-^{r}DUMU.NITA^{1}-MU.SUM LUGAL ^{m}*é-sag-gil-ki-i-ni-ub*^{1}*-ba-(sic!) um-man-nu*
18 [*ina tar-ṣ*]*i* ^{md}AG-NÍG.DU-ŠEŠ LUGAL ^{m}*é-sag-gil-ki-i-ni-ub-ba* LU(sic!) *um-man-nu*

Esagil-kīni-ubba (Saggil-kīnam-ubbib), probably the author of the Babylonian Theodicy,[9] is shown to have served as *ummānu* both under Nebuchadnezzar I and Adad-apla-iddina; his career thus spanned at least thirty-five years, although the reigns are given in reverse order.[10]

Saggil-kīnam-ubbib is independently known to have worked under Adad-apla-iddina, from K.10802 rev. 1-2.[11] On the basis of the present evidence one might hazard that Esagil-kīn-apli was Adad-apla-iddina's first appointed *ummānu*, but that he died in office and was replaced by Saggil-kīnam-ubbib, but van Dijk's remarks on W 20030, 7:16[12] make the expected restoration of Adad-apla-iddina's name unlikely.[13] A text that might have given evidence were it more complete, is the *TDP* tablet A 3442. Dated in its colophon to ITI APIN UD 17.KAM [MU *n*.KAM ^{md}X-DUMU.NI]TA-SUM-*na* LUGAL KÁ.DINGIR.RA.KI,[14] the tablet can now be reasonably dated to the reign of Adad-apla-iddina, and seen as an example of the Esagil-kīn-apli edition.

5. See J. E. Reade in E. Leichty, *Catalogue of the Babylonian Tablets in the British Museum* 6: *Tablets from Sippar*, 1 (London, 1986), pp. xxx-xxxii.
6. See *JCS* 16 (1962) 64, K.2248 2-4.
7. See *JCS* 11 (1957) 13.
8. Published by J. J. A. van Dijk, UVB 18, pp. 44-52.
9. Compare W. G. Lambert, *JCS* 11 (1957) 12; *Babylonian Wisdom Literature* (Oxford, 1960), pp. 63-64. On the restoration of K.10802:1 see *JCS* 16 (1962) 66, and J. J. A. van Dijk, UVB 18, pp. 46 and 51.
10. See J. A. Brinkman, AnOr 43, p. 115 n. 641.
11. See W. G. Lambert, *BWL* 63-64; *JCS* 16 (1962) 66, and J. A. Brinkman, AnOr 43, p. 141 n. 852.
12. UVB 18, p. 51.
13. The transliteration suggests a surviving trace of the RN ("vielleicht Raum für drei Zeichen"), but this is not shown in the copy (pl. 27), nor in that later printed in *Bagh. Mitt.* Beiheft 2 as no. 89.
14. Collated by J. A. Black; see *Studies Oppenheim*, p. 37 n. 219.

Esagil-kīn-apli's "father" is shown by the new duplicate to be Asalluḫi-mansum (not °Ištaran-šeš-mansum),[15] who functioned as *apkallu* (NUN.ME), or Sage, in the reign of Ḫammurapi.[16] *māru* here evidently must mean "descendant." In the Uruk list the term *apkallu* is chiefly used for those scholars dating to pre-Flood Days,[17] although there was a NUN.ME under Enmerkar, and the scholar who lived under Gilgameš[18] was likewise a NUN.ME. No scholar from the reign of Ḫammurapi is given in the Uruk list.

The catalogue opens with the forty incipits to the series SA.GIG, and divides the tablets into sub-series as is also found in the colophons known from the sources in Labat *TDP*. Each entry is ruled, and each incipit is prefaced with the number of lines in the tablet. Both manuscripts share the same format, although where the line totals are preserved in both, there is no agreement. After the incipits for SA.GIG comes the unusual passage that describes Esagil-kīn-apli's work. Appended to the catalogue as it is, the passage thus qualifies effectively as a colophon. The style of the SA.GIG catalogue differs in both manuscripts for the succeeding entries in that line totals for the individual tablets are omitted. It might well be that originally the catalogue to SA.GIG and the catalogue to Alamdimmû and related texts were separate, and were subsequently amalgamated. This is in some measure borne out by the placing of what we have termed the colophon to SA.GIG.

The end of the Nimrud tablet ND 4358+ is badly broken, but the phrase *niširti e*[*zida*], "secret of Ezida" (A 92) fits well with its discovery in Nabû's temple Ezida at Nimrud, and it seems probable that BM 41237+, if not itself from Borsippa, originated textually in a manuscript from Ezida in Borsippa. Thus we are dealing with the Borsippa edition of SA.GIG from the Sage of Borsippa; see B 21′ below.

The pieces ND 4358 and 4366 have now been joined and further cleaned, and J. A. Black has recently prepared a complete new copy for inclusion in the forthcoming volume of Late Assyrian texts from the Nabû temple library at Nimrud.[19] His very considerable kindness in making this copy available prior to publication and collating several passages has meant that a transliteration of the tablet, revised in the light of the Babylonian duplicate, can be given here.[20] The incipits are thus given in full for the convenience of future workers with the series.[21] One or two difficulties still remain, but the forty incipits in this edition of SA.GIG are now complete.

The following transliteration is based on A = ND 4358+4366, restored where necessary after B = BM 41237+; where B has preferable reading, however, it is adopted in the transliteration. Variations and sundry observations on new readings are given in the footnotes. Where the line totals are preserved in A and B they are quoted in that order.

15. Correct therefore *Iraq* 18 (1956) 136; UVB 18, p. 51, etc.
16. On the possible implications of this see W. G. Lambert, *JCS* 11 (1957) 6-7.
17. See also E. Reiner, *Or*NS 30 (1961) 7; J. J. A. van Dijk, UVB 18, pp. 46-47.
18. If correctly understood; see UVB 18, pp. 50-51.
19. D. J. Wiseman, J. A. Black, *Literary Texts from the Nabu Temple* (CTN 4), forthcoming.
20. J. V. Kinnier Wilson has commented on these incipits in the above-mentioned articles, so translations are not given here.
21. Labat has rather simplified the manuscript difficulties in *Traité akkadien de diagnostics et prognostics médicaux* (Leiden, 1951); the problem will need investigation if a new edition is undertaken incorporating the many new sources and commentaries, published and unpublished. Compare, for example, E. Leichty, *AfO* 24 (1975) 82-86.

SA.GIG TABLETS I-XL

Transliteration

Obv. A 1			[SAG DUB.MEŠ *u* Š]U.˹NIGIN$_2$˺ MU.MEŠ *ša* SA.GIG.MEŠ MU.X[22]
A 2	I	[. . .	*e-nu-ma ana* É] ˹LÚ˺.GIG KA.PIRIG DU-*ku*
A 3	II	[. . .	DIŠ LÚ *ana* É] ˹LÚ.GIG˺ DU-*ku*
A 4			[. . . . . .] x x[23] GIBIL NU TIL
A 5			[NIGIN . . . . . *e-nu*]-*ma ana* É ˹LÚ.GIG˺ KA.PIRIG DU-˹*ku*˺
A 6	III	[. . .]	*ana* GIG *ina* TE-*ka*
A 7	IV	[. . .]	DIŠ SAG.KI *ḫe-si-ma*
A 8	V	[. . .]	DIŠ IGI 15-*šú* KÚ-*šú*
A 9	VI	[. . .]	DIŠ KIR$_4$-*šú*
A 10	VII	[. . .]	DIŠ EME-*šú* SA$_5$-˹*át*˺
A 11	VIII	[. . .]	DIŠ GEŠTUG 15-*šú* ˹*tar-kàt*˺
A 12	IX	[. . .]	DIŠ GIG *pa-nu-šú* SA$_5$[24]
A 13	X	[. . .]	DIŠ GIG ˹GÚ-*su*˺[25]
A 14	XI	[. . .]	DIŠ *rit-ta-šú šá* 15 KÚ-˹*šú*˺
A 15	XII	[. . .	DIŠ] GABA-*su* KÚ-[*šú*]
A 16	XIII	[. . .	DIŠ SA]G ŠÀ-*šú* [SA$_5$]
A 17	XIV	[. . .	DIŠ *g*]*i-liš* 15-*šú* [SA$_5$-*át*]
A 18			[NIGIN . . . . . *ana* G]I[G] *ina* TE-*ka*
A 19			[. . . . . .]x[26] SUR.GIBIL *ṣab*-[*tu*$_4$]
A 20	XV	[. . .	DIŠ U]D 1.KAM GIG-*ma* GAR TAG-*t*[*i*]
A 21	XVI	[. . .	DIŠ U]D 1.KAM GIG-*ma* SAG-˹*su*˺ KÚ-*šú*
A 22	XVII	[. . .]	˹DIŠ˺ *ina* SAG GIG-*šú* IR *bu-bu-ʾ-ta ir-ta-*˹*ši*˺
A 23	XVIII	[. . .]	DIŠ GIG SU-[*šú*]
A 24	XIX	[. . .]	DIŠ *i-mim u* ŠED$_7$
A 25	XX	[. . .]	DIŠ GIG IR *ú-ka*[*l*]
A 26	XXI	100	DIŠ NIGIN SA.MEŠ-*šú* SILIM.MEŠ-*ma*

22. Sign perhaps B[I] or N[E]. To mark the heading, the whole line is in larger script than the remainder.
23. Signs like ˹TU BI˺.
24. Contra *Iraq* 24 (1962) 55, evidently confused; new copy unambiguous.
25. Contra *Iraq* 24 (1962) 55, evidently confused; new copy unambiguous.
26. x = lower half of broken vertical.

A 27	XXII	88	DIŠ GIG ˹*iṣ-búr*˺ 1 2 *u* 3[27] GIG *ina* ˹*še*˺-*re-e-ti il-te-*˹*né*˺-*eb-bu*
A 28	XXIII	103	DIŠ ˹ZÉ˺ *ep-ru*
A 29	XXIV	137	DIŠ ˹GIG˺ GIŠ.ḪAŠḪUR APIN-*iš*
A 30	XXV	85	DIŠ IZI.GAR *šá ina* SAG LÚ.GIG *kun-nu*
A 31			ŠU.NIGIN 14 UŠ 20 DIŠ UD 1.KAM GIG-*ma* SA x[28] ˹SA˺ SUR.GIBIL *ṣab-tu*$_4$
A 32	XXVI	60	DIŠ ŠUB-*tu* ŠUB-*su-ma*
A 33	XXVII	60	DIŠ NA *mi-šit-ti pa-ni ma-šid-ma*
A 34 B 1′	XXVIII	˹60˺	*šum*$_4$-*ma* ŠU.GIDIM.MA *ana* AN.TA.ŠUB.BA GUR-*šú*
A 35	XXIX	144	˹DIŠ ^{d}˺LUGAL.ÙR.RA ˹DU$_6$˺[29].BI Ù.TU
A 36	XXX	84	DIŠ GIG-*ma* KA-*šú* BAD.BAD-˹*te*˺
A 37 B 4′			NIGIN 4+2 UŠ 20+[. . . DIŠ Š]U[B-*t*]*ú* ŠUB-*su-ma* SA.GIG AN.TA.ŠUB.BA ^{mul}SUKUD.GIM
A 38 B 5′	XXXI	81	DIŠ UD.DA TAB-*su-ma*
A 39 B 6′	XXXII	[. . .]	DIŠ IM *iš-biṭ-su-ma*
A 40 B 7′	XXXIII	[. . .]	DIŠ ˹GIG˺ GAR-*šú* EN ˹*sa*˺-*ma-nu*[30] ŠU ^{d}ME.ME
A 41 B 8′	XXXIV	[. . .]	DIŠ ˹NA˺ *ana* MUNUS-*šú* ŠÀ-*šú* ˹ÍL˺-*šú-ma*
A 42 B 9′	XXXV	[. . .]	˹DIŠ NA˺ IGI.MEŠ-*šú* NIGIN.MEŠ-*du*[31]
A 43 B 10′			[NIGIN] 3+[. . .] UŠ 5[32] DIŠ UD.DA TAB-*su-ma* SUKUD.GIM
Rev. A 44 B 11′	XXXVI	147	*šum*$_4$-*ma* TU PEŠ$_4$-*ma* UGU S[AG].˹KI˺-*šú* [SIG$_7$]
A 45 B 12′	XXXVII	118/98	DIŠ MUNUS.PEŠ$_4$ GIG-*ma*
A 46 B 13′	XXXVIII	141/143	DIŠ MUNUS A-*šá* UD 3.KAM x-*šú*[33]
A 47 B 14′	XXXIX	152/82	DIŠ MUNUS *ḫa-riš-ti i-di-ip* ˹*i*˺-[*g*]*iš-šu*[34]
A 48 B 15′	XL	62+24/144	DIŠ LÚ.TUR *la-ʾ-ú*

27. Numeral possibly 148 (collation by Black). Reading *iṣ-búr*(?) after *Iraq* 18 (1956) copy; 1 2 3 after new copy, quite provisional; the equivalent incipit in *TDP* 176:1 reads simply [DIŠ GI]G *ina še-re-e-ti il-te-né-eb-bu* . . . (Tablet "23"), which might suggest that this line in fact contains what should be two incipits.
28. x: broken Winkelhaken followed by vertical visible as ˹IGI˺ (collation by Black).
29. This tablet has remained unknown, but now the following Late Babylonian unpublished pieces have been identified by the writer: (i) BM 42310+; (ii) BM 46563; (iii) BM 56605; and (iv) an unnumbered fragment. BM 38375 is a fragment of a commentary on this tablet. The sources suggest that DU$_6$.BI rather than KI.BI is to be read. The format of this tablet differs noticeably from *TDP* generally. The medical problems are linked in the obverse to the age of the patient (DIŠ *ina* MU *n*.KAM ŠUB-*su* . . .), and in the reverse to the spot where the patient is at the time of attack (for example, DIŠ AN.TA.ŠUB.BA *ina a-lak gir-ri* ŠUB-*su* . . .). Each "omen" or diagnosis has a magical/medical prescription appended, in some cases even including the incipits of the incantations to be used. One would scarcely identify the text as SA.GIG were the first line not preserved. BM 56605 has on its reverse a mysterious table of astrological significance, a duplicate to which is BM 40680.
30. EN clear; ˹*sa*˺- short, but probable (collation by Black).
31. A: NIGIN.MEŠ-*du*; B: NIGIN$_2$-[. . .].
32. A: [NIGIN] ˹3˺+[. . . U]Š 5; B: [. . .]+1 UŠ 5.
33. x like B[I or TA[B.
34. Confirmed by H. Hunger, *Spät Babylonische Texte aus Uruk* 1 (Berlin, 1976), no. 40.

A 49	B 16′	NIGIN 5+6[35] UŠ 42 MUNUS.ᶠPEŠ₄ᵀ [x] x ᶠ*ṣab-tu₄*ᵀ[136] GIŠ.GIŠ.A
A 50	B 17′	ŠU.NIGIN 40 DUB.MEŠ 3000+ x x[37] [. . . M]U.MEŠ *šá* SA.GIG ZAG.TIL.LA.BI.ŠÈ

ESAGIL-KĪN-APLI'S EDITORIAL WORK

A 51-2	B obv. 18′	*ša ul-tu ul-la* SUR.G[IBIL] ᶠ*la*ᵀ *ṣab-tu₄ ù* GIM GU.MEŠ ᶠGIL.MEŠ[38] *ša*? GABA.RI[139] NU TUKU
A 53-4	B rev. 19′	*ina* BAL-*e* [md]IM-DUMU.NITA-MU[40] LUGAL TIN.TIR.KI[41] GIBIL.BI.ŠÈ [x].ÀM[42]
A 54-5	B 20′	[m]*èš-gú-zi-gin-a*[43] DUMU[44] [md]*asal-lú-ḫi-ma-an-sum*[45] NUN.M[E] ᶠᵐᵀ*ḫa-a*[*m*]-*mu-ra-pí* LUGAL
A 55-6	B 21′	*um-mat* [d]30 [d]*li₉-si₄ u* [d]*na-na-a* BARA₂.SIPA.KI-*i reš-ti-i*
A 57-8	B 22′	ZABAR.DAB.BA *é-zi-da pa-šiš* [d]Ì.ZU.ZU[46] *na-áš* DUB *ši-mat* DINGIR.MEŠ *saníq mit-ḫur-t*[*ú*][47]
A 59-60	B 23′	*i-šip-pu ram-ku šá* [d]*nin-zíl-zíl-le be-let tak-né-e ta-li-mat nar-mi-šú*
A 60-1	B 24′	UM.ME.A KUR EME.KU *u* URI.KI *ina* GEŠTUG[II] *ni-kil-ti šá* 40ᴵ *u* PAP.PAP[48] *iš-ru-ku-šú*
A 61-2	B 25′	*ina ka-bat-ti-šú uš-ta-bil-ma* SA.GIG[49] TA *muḫ-ḫi* EN GÌR.ME[Š]
A 62	B 26′	[S]UR.GIBIL DIB.MEŠ-*ma ana* NÍG.ZU DU-*in it-id* ᶠ*pit*ᵀ-[*qad*]
A 63-4	B 27′	[NÍG.Z]U.ZU.ŠÈ NAM.BA.ŠE.BI.DA[50] *šá* NÍG.ZU NU GUB.BI[51] *sa-kik-ka ul* DUG₄.[GA-*ma*]
A 65-6	B 28′	[*al*]*am-dím-ma-a ul i-nam-bi sa-kik-ka ri-kis* GIG *u ri-kis k*[*u-ri*][52]
A 66-7	B 29′	*alam-dím-mu-ú bu-un-na-an-né-e la-a-nu ši-mat* NAM.LÚ.U₁₈.L[U]
A 67-8	B 30′	*šá* 40 *u* PAP.PAP[53] *i-ši-mu šá* ÉŠ.GÀR *ki-lal-la-an* K[É]Š-*su-nu*[54] 1-*ma*
A 69	B 31′	[*a-ši-pu*(?)] TAR-*is*[55] EŠ.BAR *ḫa-ᵓ-iṭ* ZI-*tì* UN.MEŠ
A 70-1	B 32′	[*sa-k*]*ik-ka u alam-dím-ma-a ka-liš* ZU-*ú li-ḫi-iṭ lib-ri lìb-bi*
A 71	B 33′	[*liš-ta-bil*]-*ma ana* LUGAL ME-*a liš-kun*

35. A: 4+6; B: 5+6.

36. A: MUNUS.P[EŠ₄ . . . . . .] GIŠ.GIŠ.A; B: MU[NUS].ᶠPEŠ₄ᵀ [(x)] x ᶠ*ṣab-tu₄*ᵀ GIŠ.[. . .].

37. A: ŠU.NIGIN 40 DUB.MEŠ 3000 + 6? + 4? = [. . .]; B: ŠU.NIGIN 40 1800+[. . .].

38. The *editio princeps* offered SUMUN.MEŠ ᶠGIL.MEŠᵀ, "obscure originals" (see W. G. Lambert, *JCS* 11 [1957] 6 and 13-14), but the new copy shows a clear GU.MEŠ ᶠGIL.MEŠᵀ, "twisted threads," thus adopted here. Professor Köcher suggests GIB.MEŠ, "crossed." On SUR.GIBIL (= *za-ra-a*) see *Iraq* 18 (1956) 138, *JCS* 11 (1957) 14, and YBC 7123 rev. 5′ elsewhere in this volume.

39. LÚ before GABA.RI (see *Iraq* 18 [1956] 138-39) is not visible at all in the new copy; *ša* remains uncertain.

40. A: *ina*, [md]ᶠIMᵀ-DUMU.NITA-SUM.NA; B: *ina*, [d]IM-DUMU.NITA-MU.

41. A: ᶠKÁᵀ.DINGIR.RA.ᶠKIᵀ.

42. A.AN now seems clear contra]-*šá-an*; the restoration proposed in *JCS* 11 (1957) 13 is thus ruled out. An adverb is probably to be restored.

43. A: [m]*èš-gú-zi-gin-a*; B: [m]ᶠ*èš-gú*ᵀ-*zi-gi-a*.

44. A: A.

45. Since B has [d]*asal-lú-ḫi-ma-an-sum*, [d]ᶠKA×DI-ŠEŠᵀ-*ma-an-sum* in A is now seen as [d]*asalᵓ-lú-ḫi-ma-an-sum* (confirmed by Black); compare p. 150 below.

46. A:].ᶠBAR.DABᵀ; B: ZABAR.DAB.BA; A: ḪAL.NI.ZU.ZU, also in new copy.

47. A: *sa-ni-qu mi*[*t*]-ᶠ*ḫur*ᵀ-*t*[*i*].

48. A: *ina* UD IR-*kil-ti* (collation by Black); A: 20 (+), (worn) *u* x[(3 small initial horizontals: new copy); B: 50 (*sic*) *u* PAP.PAP; see note 62.

49. A: SA.GIG.MEŠ ᶠ*iš*ᵀ-[*tu*; B: SA.GIG TA.

50. = *ana iḫzīka la teggi*; compare *it-i-id la te-eg-gi* (*JNES* 33 [1974] 200 71), and *it-id pit-qad la te-gi* in the passage partly quoted below at footnote 57.

51. The translation assumes that GUB here is an unsupported ideogram for *kašādu*; compare *CAD* E 47 sub *iḫzu* A.

52. A: omits SA.GIG, continues ᶠ*ri*ᵀ-*kis ku*-[*ri*] *ri*-[*kis*] ᶠGIGᵀ [*u ri-kis a-di*]*r-ti*.

53. A: *šá* 40 *u* [. . .]; B: [. . .] PAP.PAP; see footnote 62.

54. A: perhaps KA rather than KÉŠ; B: K[É]Š.

55. A: unidentified trace (x AŠ?) corresponding approximately to TAR-*is*.

B Obv. 18′ Concerning that which from old time had not received an [authorised] edition, and according to 'twisted threads' for which no duplicates were available,[56]

B Rev. 19′ In the reign of Adad-apla-iddina, King of Babylon, to work it anew . . . ,

20′ Esagil-kīn-apli, son of Asalluḫi-mansum, the Sage of King Hammurabi,

21′ the *ummatu*[57] of Sin, Lisi and Nanai, a prominent citizen of Borsippa,

22′ the *zabardabbû* of Ezida,[58] the *pašīšu* of Nabu[59] who holds the gods' Tablet of Fate, and can reconcile conflicting things,

23′ the *išippu* and *ramku* priest of Ninzilzil,[60] lady of loving trust, 'sister'[61] of his loved one,

24′ the (chief) scholar of Sumer and Akkad, through the incisive intelligence that Ea and Asalluḫi/Marduk(?)[62] had bestowed on him,

25′ deliberated with himself, and produced the authorised editions for SA.GIG, from head to foot,[63]

26′ and established them for knowledge. Take care! Pay [attention!]

27′ Do not neglect your knowledge! He who does not attain(?) knowledge must not speak aloud the SA.GIG omens,

28′ nor must he pronounce out loud Alamdimmû! SA.GIG (concerns) all diseases and all (forms of) distress;

29′ Alamdimmû (concerns) external form and appearance (and how they imply) the fate of man

30′ which Ea and Asalluḫi/Marduk(?) ordained in Heaven. (Regarding) the twin series, their arrangement is one.[64]

56. The Uruk commentaries to *TDP* available in SpBTU vol. 1 are consistently described where preserved as being *ša pî ummāni/ummānī*, "according to the Sage(s)." Admittedly this attribution occurs in commentaries to other texts, but does it here perhaps mean that Esagil-kīn-apli also wrote explanations of the difficult passages?

57. The term *um-mat* occurs also in CRRAI 19, p. 436 12, but its meaning remains uncertain. The present passage shows that the citation in *AHw*, p. 1415 sub *ummatu* 3) c) as subordinate to *mukīn* . . . must be corrected. A meaning "descendant" in the Nebuchadnezzar I text seems probable, and support for this might be provided by the passage quoted from Rm 17+ and BM 55148+ below, where ŠÀ.BAL.BAL [d]*li₉-si₄ a a* corresponds to *um-mat* [d]30 [d]*li₉-si₄ u* [d]*na-na-a*. Compare also K 2596 rev. iii 18′-20′ (drawn to my attention by W. G. Lambert), a colophon describing the textual history of the incantations against agricultural pests:

AŠ(for [m]) [d]<PAP>.SUKKAL.DUG₄.NU.
BAL.BAL *u*[*m-mat* . . .]
ŠU.AN.NA.KI ZABAR.DAB.BA [d]*na-bi-um* [. . .]
GUDU₄ *é-sag-íl u é-zi-da ki-i*[. . .]

For the name of this scholar-scribe see *JCS* 11 (1957) 13:51.

58. Compare the scribal ancestor Baba-šum-ibni, in colophons from Assur, who is described as *zabardabbû* of Ešarra; see now O. Pedersén, *Archives and Libraries in the City of Assur* part 2, Acta Universitatis Upsaliensis, Studia Semitica Upsaliensia 8, p. 45 n. 22.

59. For [d]*i-zu-zu* as a name of Nabû see F. Pomponio, *Studi Semitici* 51 (1978) 158-159.

60. [d]*nin-zíl-zíl* is given as Emesal for Nanai in MSL 4 9:90 (compare W. G. Lambert, *MIO* 12/2 [1966] 45); she is described as [d]*na-na-a* DUMU.MUNUS [. . .] *šá man-za-as-su šá-qu-u be-let tak-né-e* [. . .] in CT 25 49 7-8, and the syncretistic hymn *KAR* 109 22 states that in BARÁ.SIPA.KI [d]*nin-zíl-zíl-le be-let tak-né-e zi-kir-šá*.

61. It is assumed that *narmû* stands for *narāmu* (compare *CAD* N/1 361 sub *narmû*), and refers to Nabû, and that *-šú* refers to Esagil-kīn-apli; *talimtu* must therefore mean "lover" here.

62. In line 30′, A offers 40 *u* [. . .] and B [. . .] PAP.PAP where gods must be meant, and since the ordaining of human fate must be largely Ea's responsibility (compare K.2448 2-3 referred to above), 40 may be trusted; in the parallel phrase in line 23′ A has ᶠ30ᵀ and B ᶠ50ᵀ which must be emended. PAP.PAP seems likely to stand for Asalluḫi/Marduk, although no support can be offered; [d]PAP.PAP = DUMU.MUNUS [d]*nin-šubur* (*Keilschrifttexte aus Assur verschiedenen Inhalts* 50 i 7-8), explained as LÚ KÁ *na-qid*, is no doubt irrelevant.

63. *a capite ad calcem* (MSL 16, p. 23 and refs.) expressed in Akkadian! Compare also line A 77 below, *TDP* 28 86-96, and R. D. Biggs, *RA* 62 (1968) 58 17′.

64. That is, both organized by this tablet.

31′ [Let the *āšipu*] who makes the decisions, and who watches over people's lives,
32′ who comprehensively knows SA.GIG and Alamdimmû, inspect (the patient) and check (the appropriate series),
33′ [let him ponder], and let him put his diagnosis at the disposal of the king.[65]

In many ways this passage is a remarkable one. According to this text, SUR.GIBIL (= *za-ra-a*) *ṣabātu* effectively represents the process of "canonisation" so often discussed by Assyriologists; a text is established from disparate sources to represent the standard version of the composition. The expression is also applied to the individual sub-series in A 19 and A 31; compare also A 49 (not apparently SUR.GIBIL), and also A 4: GIBIL NU TIL. Other technical terms here, still quite obscure, are (su)SUKUD.GIM in A 37 and A 43, and GIŠ.GIŠ.A in A 49 and A 91. The passage is direct supportive evidence for the conventional placing of "canonisation" in the second half of the second millennium, and provides a unique glimpse of a major scholarly effort from a master scribe.

In the *Exorcist's Manual* KAR 44, the opening section (obv. 2 - rev. 3) lists the "incipits of the series of *āšipūtu* which have been established for knowledge and study" (SAG.MEŠ ÉŠ.GÀR MAŠ.MAŠ-*ti šá ana* NÍG.ZU *u* IGI.DU_8.A *kun-nu*). The following section (rev. 5-20) is, in contrast, described as the "incipits of the series of *āšipūtu* according to Esagil-kīn-apli (SAG.MEŠ ÉŠ.GÀR MAŠ.MAŠ-*ti šá* m*e-sag-íl*-DU-A). Two new Late Babylonian duplicates to KAR 44 to be published by M. J. Geller (Rm 717+ and BM 55148+) offer fuller information at this point, and are particularly relevant to the passage under study. Rm 717+ (with variants from BM 55148+) reads as follows:

Rev. 3. ŠU.NIGIN ᵉÉŠ.GÀR *a-ši-pu-tu* (var. MAŠ.MAŠ-x[. . .) *šá* m*èš-gú-zi-gin*ᴵ-DUMU×UŠ (var. m*è*]*š-gú-zi-gi-in-a*) DUMU md*asal-lú-ḫi-*[*ma-an-su*]*m*
4. NUN.ME m*ḫa-am-mu-ra-pí* LUGAL ŠÚ (var. x[. . .]) ŠÀ.BAL.BAL $^{d}li_9$-si_4 A (var. A A) *i-šip-pu* (var. $GUDU_4$) *é-zi-da* (var. adds [. . .])

The anonymity of cuneiform literature has been stressed by W. G. Lambert,[66] who emphasized the importance of the *Catalogue of Texts and Authors*[67] as being exceptional in approach. The present text, now more or less complete, shows both one individual at work, and the care with which those who were to use that work were to proceed. In its rather cryptic use of a colophon-style mixture of Sumerian and Akkadian and its choice of unusual words and gods the passage embodies the protective attitude of the *āšipu* to his inherited lore. The closing lines likewise are suggestive. It is interesting that while the *āšipu* is seen as responsible for health at large, it is primarily the king for whom the practical value of his knowledge is to be put to use, unless this is mere diplomatic hyperbole. Furthermore, would it be wholly inappropriate to see in the injunction to safeguard the corpus, study the symptoms, and produce the correct diagnosis on request a faint anticipation of the admonitions of Hippocrates?

65. ME-*a* is taken to stand for *qību*; for passages in which this means a medical diagnosis, construed with *šakānu*, see *CAD* Q, p. 249 sub voce.

66. See *JCS* 11 (1957) 1.

67. See *JCS* 16 (1962) 77.

ALAMDIMMÛ

A 72 B 34′	I	DIŠ SAG.DU IGI BAR-*at* DINGIR.MEŠ[68]
A 72 B 35′	II	DIŠ ⌜ŠÀ.NIGIN⌝ [*ina* SA]G.DU LÚ *saḫ-ru*
A 73 B 36′	III	DIŠ SAG.KI NU TUKU
A 73 B 37′	IV	DIŠ SIG_7 IGI 15 *ka-bar*
A 74 B 38′	V	DIŠ ⌜KIR_4⌝-*šú a-ri-ik*[69]
A 74 B 38′	VI	DIŠ EME-*šú nam-*⌜*rat*⌝[70]
A 74 B 39′	VII	DIŠ ⌜TE.MURUB_4⌝.MEŠ-*šú* x-ᵓ-x[71]
A 75 B 40′	VIII	DIŠ *pa-nu-šú* GÍD.DA
A 75 B 41′	IX	DIŠ GÚ-⌜*su*⌝ GÍD.DA
A 75 B 42′	X	DIŠ GABA-⌜*su*⌝ GÍD.DA[72]
A 76 B 43′	XI	DIŠ ⌜UMBIN⌝ GIM GU_4 GAR-*in*[73]
A 76 B 44′	XII	DIŠ *alam-dím-ma-*[*a* . . . . . .]

A 77 B 45′	NIGIN 12 DUB.MEŠ *alam-dím-mu-ú* TA *muḫ-ḫi* EN GÌ[R^{II} ZAG.TIL.LA.BI.ŠÈ]

NIGDIMDIMMÛ

A 78 B 46′	I	DIŠ paʔ m[uʔ x (x)]-*šú* šà gi ⌜gan⌝ sa SA_5[74]
A 78 B 47′	II	DIŠ [x] IGIʔ SAG.DU-*su* x [x][75]

B 48′	[NIGIN 2] DUB.MEŠ [*níg-dím-dím-mu-ú* . . . . .][76]

KATADUGGÛ

A 79 B 49′	[DIŠ x (x)] x DINGIR.MEŠ GAL.MEŠ *šá* NAM.LÚ.⌜U_{18}.LU⌝ [*z*]*a-qí-iq-šá ana* EN.LÍL-[*ti*]
A 80 B 50′	[GAR-*nu*] *ù ka-ta-dug*$_4$*-ga šá ana re-te-et* ⌜GÌR^{II}⌝-*šá ú-kin-nu*

A 81 B 51′	1 DUB DIŠ *ka-*⌜*ta-dug*$_4$*-ga*⌝*-ú*[77]

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68. A: DIŠ SAG.DU IGI BAR-*at* DINGIR.MEŠᴵ(ME.U) (after new copy, contra *Iraq* 24 [1962] 55 29a); B:] x KID B[AR]-*at* DINGIR.MEŠ. This tablet is unidentified. Note that unusually this series is named after Tablet XII rather than Tablet I.

69. A: *a-rik*.

70. A: *nam-*⌜*rat*ʔ⌝; B: *nam-*⌜*rat*⌝ clear.

71. A: ⌜DIŠ TE⌝ [. . .].

72. In this and preceding entry B apparently omits *-su*.

73. A: DIŠ ⌜UMBIN⌝ GIM GU_4 GAR-*in*; B: DIŠ GIŠ.X GIMʔ GU_4 [. . .].

74. Reading from A; B: DIŠ *ana* DINGIR-*šú* ŠÀ GI x x [. . .] (AŠ before ŠÀ probably erasure).

75. Reading from A; B: DIŠ LÁ KA X-*šú* [. . .]; SAGᴵ.DUᴵ unlikely.

76. This rubric omitted in A. For the restoration compare K.13280+13818 obv. 10-12: [. . .] 37 ÉŠ.GÀR *alam-dím-mu-u* [. . .] *a-di* BAR.MEŠ *níg-dím-dím-mu-u* [. . . *u k*]*a-ta-dug*$_4$*-ga-u* (see S. Parpola, *JNES* 42 [1983] 24-25; F. R. Kraus, *Texte zur babylonischen Physiognomatik*, AfO Beiheft 3 (Berlin, 1935), no. 51; *Iraq* 24 [1962] 53). See also CT 54 106 15 and F. Rochberg-Halton, ed., *Language, Literature and History: Philological and Historical Studies presented to Erica Reiner*, AOS 67 (New Haven, 1987), p. 163.

77. Compare *Iraq* 24 (1962) 53 and 57. In A line 81 is written over the ruling between 80 and 82 as if added later (J. A. Black).

ŠUMMA SINNIŠTU QAQQADA RABIAT

A 82	B 52′	I	[DIŠ MUNUS S]AG.DU GAL-*at*
A 83	B 53′		[DIŠ MUNUS] x x[78] GAL-*at* GIBIL NU TIL
A 84		II	[DIŠ . . . . . .] x SAG.DU-*šú* 15 GUR-*ru*[79]
A 85			[NIGIN 2 DUB].MEŠ DIŠ MUNUS SAG.DU ⌜GAL-*at*⌝

ŠUMMA LIPTU

A 86	[DIŠ TAG-tu_4 *ina* SAG].DU NA BAR-⌜*ma*⌝ [x]en⌝ *li*⌝-*ip*⌝-*te*⌝ *pi tu šú i-* <. . .>
A 87	[DIŠ . . . . .]x bi ku [x x x][80]
A 87	⌜DIŠ SAG⌝.DU NA *zaq-pat* [Š]À um ud⌝ en [(x)]
A 88	[DIŠ . . . *ina* SAG].DU NA [. . . . .] A.MEŠ ŠUB.MEŠ MIN *ina ḫu*-U[B-x]
A 89	*ù i*-x-(x)-⌜*gi*⌝
A 90	[NIGIN[81] . . . DUB].⌜MEŠ⌝ [DIŠ] ⌜*li*⌝-[*ip*]-⌜*te*⌝

SUMMARY

A 91	[ŠU.NIGIN . . . . . DUB.MEŠ ÉŠ.GÀR *ala*]*m-dím-mu-ú* ZAG.TIL.LA.BI.ŠÈ GIŠ.GIŠ.A
A 92	[ŠU.NIGIN . . . . . DUB.MEŠ SA.G]IG.MEŠ *alam-dím-mu-ú* ⌜SAL.ŠEŠ⌝ *é*-[*zi-da*]
A 93	[. . . . .] AL⌝.TU.RA ŠUM.MA.⌜ME⌝[82]

It is evident from the summary that Nigdimdimmû, Kataduggû, Šumma Sinništu, and Šumma Liptu were considered the sub-series to Alamdimmû. The uncertainty concerning the number of tablets to Šumma Liptu means that the missing final totals cannot be filled in for certain. J. V. Kinnier Wilson suggested six tablets for the latter case, so the resulting total would be 40+12+2+1+2+6 = 63 tablets for the twin series SA.GIG and Alamdimmû, representing the editorial achievement of the Sage of Borsippa.

While on the subject of the SA.GIG medical omens we may conclude with a text of a very different stamp. This is BM 47687+48517(81-11-3,392+1228), joined by the writer, and given in

78. A: [. . .] GAL-*at*; B: . . .] x x [. . . ; the GIBIL NU TIL here, in view of A obv. 4 above, shows that this entry is not to be taken as a third series tablet incipit.

79. See *Iraq* 24 (1962) 58 n. 31.

80. Rm 268+ (*TBP* no. 50) gives the incipit for Tablet II as DIŠ GIG.PEŠ *ina* SAG.DU LÚ GAR-*in* NA BI [. . .]; should one read then . . .N]A BI *ku*-[. . .]?

81. The correct total here and understanding of lines 86-90 must await new evidence; compare S. Parpola, *JNES* 42 (1983) 26.

82. ŠUM.MA.ME is taken to stand for *šummū*, "the ifs," that is, the medical omens themselves. ME⌝ is followed by a small low subscript sign like ZA.

copy as Figure II. This single-column tablet is likewise registered as being from Babylon, and is a record of miscellaneous material copied from a wooden tablet. The obverse contains what might be styled a "Poor Man's *TDP*," since the author has with great despatch reduced the complexity of the forty tablets of SA.GIG to a single statement for each part of the body, arranged approximately (*pace* line 20) *ištu qaqqadi adi šēpē*, of which the following diagnoses survive:

BM 47687+

Transliteration

Obv. 1 [. . . *iš-ta-na*]-*as-si* ŠU ^{d}*a-nim* : ^{d}[. . .]
2 [. . . . . .-*šú* K]Ú.KÚ-*šú* ŠU ^{d}[. . .]
3 [. . . . . .-*šú* K]Ú.KÚ-*šú* ŠU ⌜^{d}⌝[. . .]
4 x-[. . .-*šú* K]Ú.KÚ-*šú* ŠU ^{d}[. . .]
5 x-[. . .-*šú* K]Ú.KÚ-*šú* ŠU ⌜^{d}⌝[. . .]
6 x-[. . .-*šú* KÚ.K]Ú-*šú* ŠU ⌜^{d}⌝[. . .]
7 x-[. . .-*šú* KÚ.K]Ú-⌜*šú* ŠU ^{d}⌝[. . .]
8 [. . . . . Š]U ^{d}[A]MAR.UTU
9 x.x-⌜*šú*⌝[KÚ.KÚ-*šú*] ŠU ^{d}*a-nim*
10 ⌜KA⌝-*šú* [KÚ.KÚ-*š*]*ú* ŠU ^{d}IM
11 EME-*šú* <<*u*>> *mut-ta-bil-t*[*a-šú* KÚ.KÚ]-*šú* ŠU ^{d}⌜li_9⌝-si_4!
12 GABA-*su* K[Ú.KÚ-*š*]*ú* ⌜ŠU ^{d}*iš*⌝-*tar*
13 BAR.SÌL MIN-*šú* ⌜KÚ⌝.[KÚ-*šú* ŠU ^{d}P]A *u* ^{d}LUGAL
14 Á 15-*šú* KÚ.K[Ú-*šú* Š]U ⌜^{d}*iš-tar*⌝
15 Á 150-*šú* ⌜KÚ⌝.K[Ú-*šú* Š]U ^{d}[. . .]
16 ŠÀ.MEŠ-*šú* SAR.⌜MEŠ⌝-*ḫ*[*u* Š]U ^{d}[. . .]
17 MURUB$_4$.MEŠ-*šú* KÚ.KÚ-*šú* ⌜ŠU⌝ ^{d}[. . .]
18 GÌR 15-*šú* KÚ.KÚ-*šú* ŠU ^{d}[. . .]
19 GÌR ⌜150⌝-*šú* [K]Ú.KÚ-*šú* ŠU ^{d}[. . .]
20 ⌜UGU⌝ *ma-ḫi-iṣ* [(. . .)] ŠU ^{d}*za-*[*ba*$_4$-*ba*$_4$]
21 x [x (x)-*šú* K]Ú.⌜KÚ-*šú* ŠU ^{d}⌝[. . .]
22 [. . . . . .-*šú*]⌜KÚ.KÚ⌝-[*šú* ŠU ^{d}. . .]
(Remainder, perhaps two lines, lost)

The reverse of BM 47687+, missing perhaps a single line at the top, lists and equates the watches of the night (1′-3′), and gives prescriptions for salves (and in one case a fumigant) against fever (4′-6′), the evil *alû* (7′-9′), and madness (10′-11′). The scribe's name survives, and the colophon may be restored with some confidence as follows:

[TA GI]Š.DA ZI-*ḫi* GIM SUMUN-*šú* SAR-*ma*
[IGI.KÁR IGI.TAB Š]U ^{m}*še-ma-*$^{?}$*-ia*
[A-*šú šá* ^{m}]⌜^{d}⌝*za-ba*$_4$-⌜*ba*$_4$⌝-[NUNUZ-ŠEŠ A ^{m}*e-ṭi-ru*/A-DI-*ru*]

This tablet belongs with a group of scholarly texts in a similar hand and style, all found in the 81-11-3 collection, whose scribal names from the colophons invite comparison:

(a) BM 47463 (81-11-3,168), explanatory text:[83]

DUB AŠ *še-ma-ʾ-iá* A ^{m}A-DI-*ru*

(b) BM 47451 (81-11-3,156), bil. ušburruda inc.:

ŠU^{II} ^{m}*še-ma-ʾ-iá* A-*šú šá* ^{md}*za-ba*$_4$*-ba*$_4$*-pir-ʾu-*ŠEŠ A ^{m}A-DI-*ru*

(c) BM 47459 (81-11-3,164), ritual:

IM.GÍD.DA ^{m}[. . . . .] ^{md}*za-ba*$_4$*-ba*$_4$-NUNUZ-Š[E]Š DUMU ^{m}*e-ṭi-ru*

(d) BM 47491 (81-11-3,196), *Frauenkrankheit*:

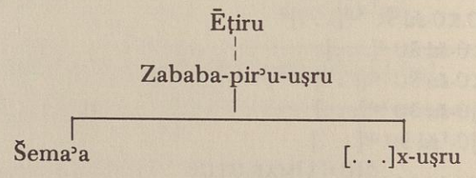
IM AŠ *še-ma-ʾ-ia* DUMU *šá* ^{d}*za-ba*$_4$*-ba*$_4$-NUNUZ-ŠEŠ A ^{m}*e-ṭi-ru*

A further text must also be compared:

(e) BM 47506 (81-11-3,211), medical:

[. . . . . ^{m}. . .]x-*uṣ-ru* A-*šú šá* ^{md}*za-ba*$_4$*-ba*$_4$*-pir-ʾu-*ŠEŠ A ^{m}*e-ṭi-ru*

Since A may be read *e* (^{d}*e*$_4$*-ru*$_6$ etc.), taken together these colophons provide the following branch of a scholarly family tree for Babylon in the Persian period:



It is likely that Zababa here is to be understood and read as Marduk, in which case two further spellings may be compared:

(f) BM 47529+47685 (81-11-3,234+390), Comm. on Marduk's Address:

[. . .]^{r}^{d}^{1}ŠÀ.ZU-*pir-ʾu-uṣ-ru* A ^{m}*e-ṭ*[*i-ru*]

(g) BM 47462 (81-11-3,167), *aḫūtu* Alu omens:

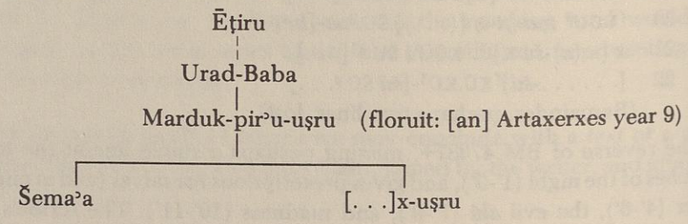
AŠ SIRSIR[84]-NUNUZ-ŠEŠ A ^{m}*e-ṭ*[*i-ru*]

A third, in which ^{d}AMAR.UTU is written, adds another generation:

(h) BM 47456 (81-11-3,161), Iqqur-Ipuš:

ŠU^{II} ^{md}AMAR.UTU-NUNUZ-ŠEŠ DUMU *šá* ^{m}Ì^{l}R-^{d}KÁ A ^{m}A-DI-*ru*

Provisionally, then, one may suggest the following:



83. Published in A. Livingstone, *Mystical and Mythological Explanatory Works of Assyrian and Babylonian Scholars* (Oxford, 1986), pls. iii-v; see pp. 259-260. There seems to be no sure reason to assume that ^{m}*še-ma-ʾ-a* is a Hebrew scribe, since *-ma* would be expected. The use of AŠ for DIŠ before the name also in BM 47491 and BM 47462 below shows that this is not a mistake in BM 47463; compare K.2596 rev. iii 18′ at footnote 57 and, e.g., K.8173 11′-12′: AŠ ^{d}Ì.ZU.ZU-ZU-DU.DU A AŠ ^{d}KU.KU.x [. . .] ^{r}*a-na*^{1} *ta-mar-ti-šú iš-ṭur* (colophon).

84. For Sirsir = Marduk see B. Landsberger, *WO* 1 (1947) 362-366.

Note finally one further text from this group:

(i) BM 47447 (81-11-3, 152), Comm. on EAE:

IM ^{m}*še-ma-ʾ-ia* A ^{m}Ì^{l}R-^{d}*ba-ú* A ^{m}*e-ṭi-ru*,

dated ITU.ÁŠ UD 23.KAM MU 19.KAM ^{m}*ar-tak-šat-su* LUGAL.

It is curious that Šema'a has omitted his father's name. Comparison of these colophons highlights the uncertainties involved in reconstructing scribal families.

The preceding remarks[85] are respectfully dedicated to the memory of Abraham J. Sachs, who was a bit of an *apkallu* himself. Would but that the present publication were his *Festschrift* and not his Memorial Volume.

85. It is a pleasure to acknowledge the helpful discussion of several points in this paper with J. A. Black, M. J. Geller, J. V. Kinnier Wilson, and W. G. Lambert. I am particularly grateful to Prof. Franz Köcher for his careful reading of the manuscript. Such errors as may have escaped remain the writer's responsibility.

FIG. I. BM 41237+46607+47163

Obverse

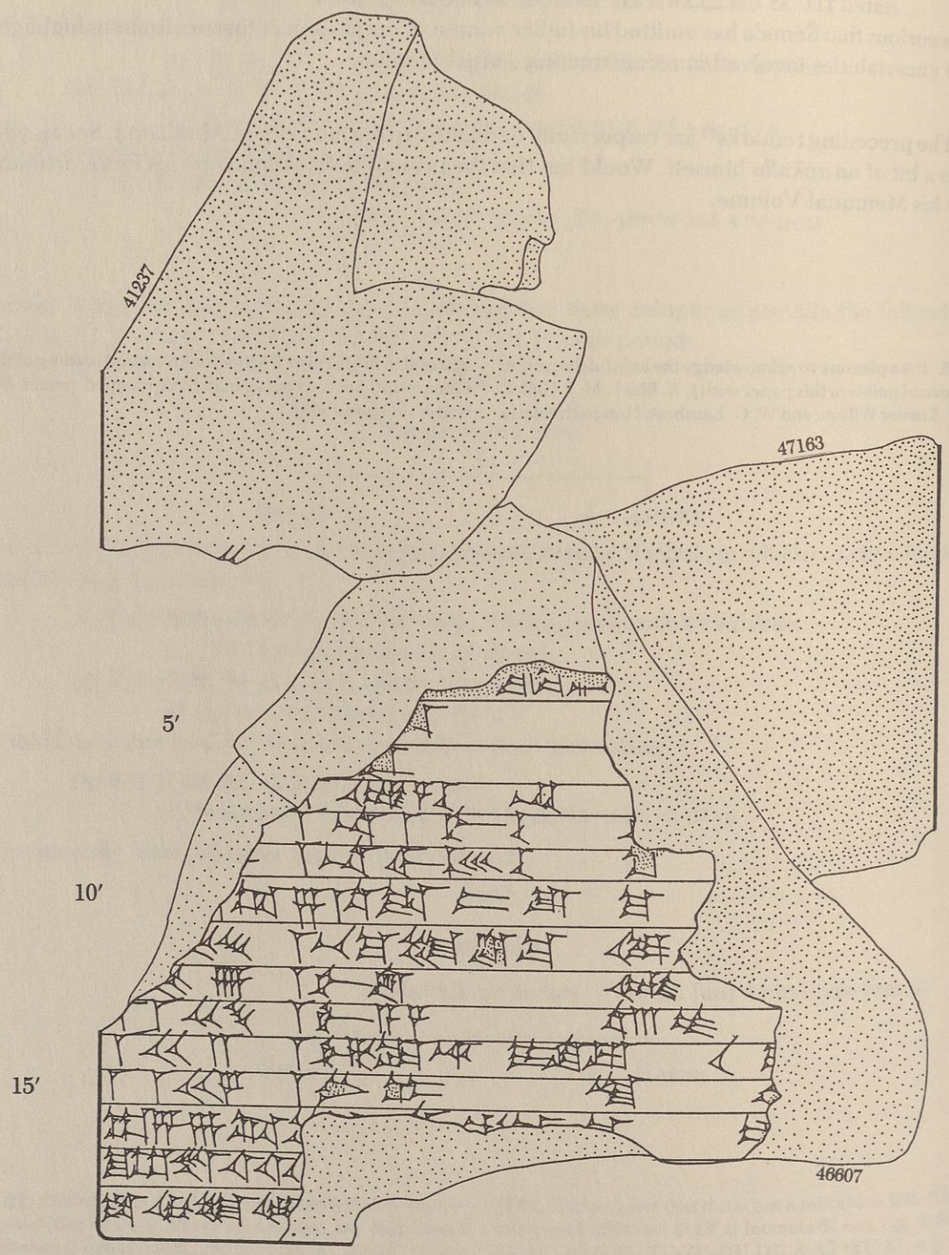


FIG. I. BM 41237+46607+47163

Reverse

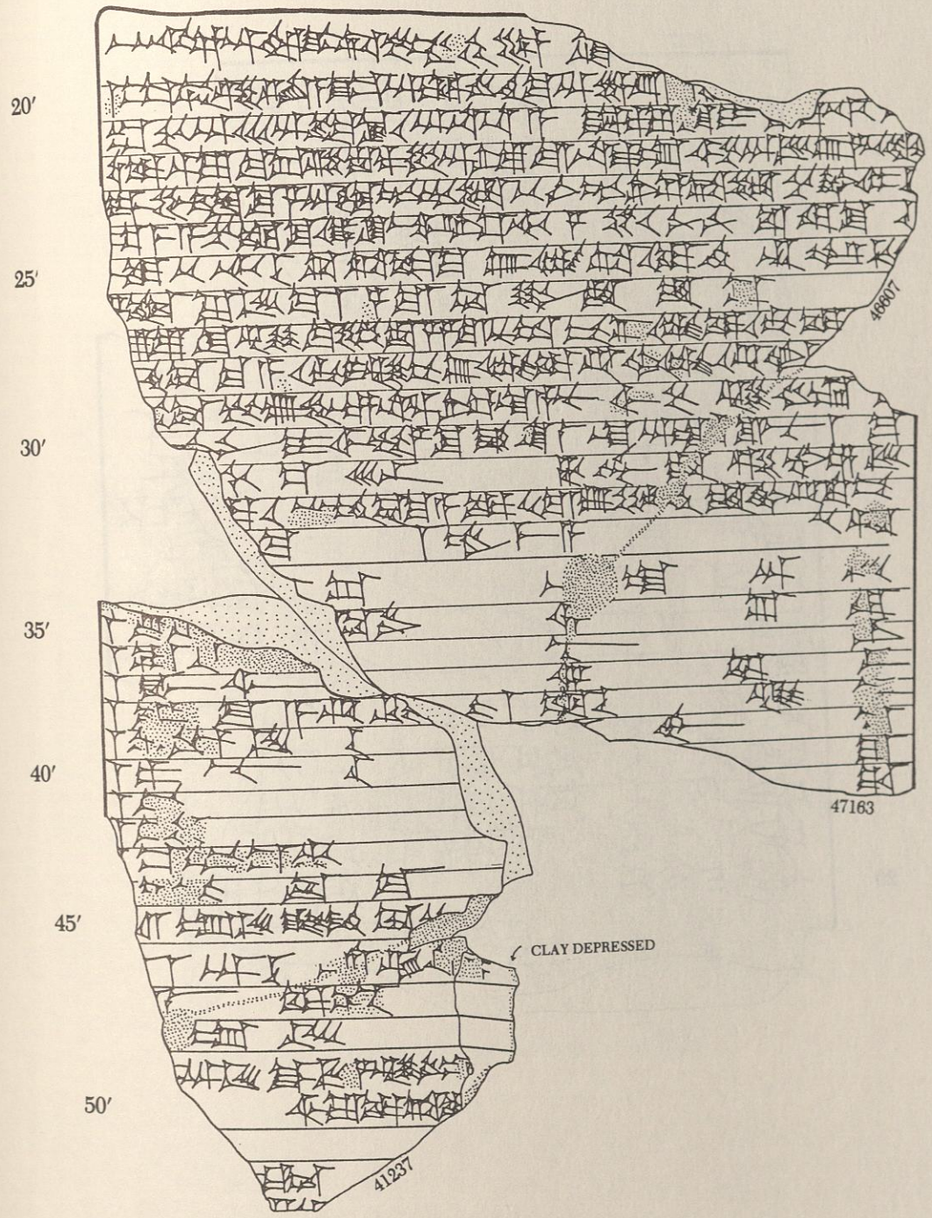


FIG. II. BM 47687+48517

Obverse

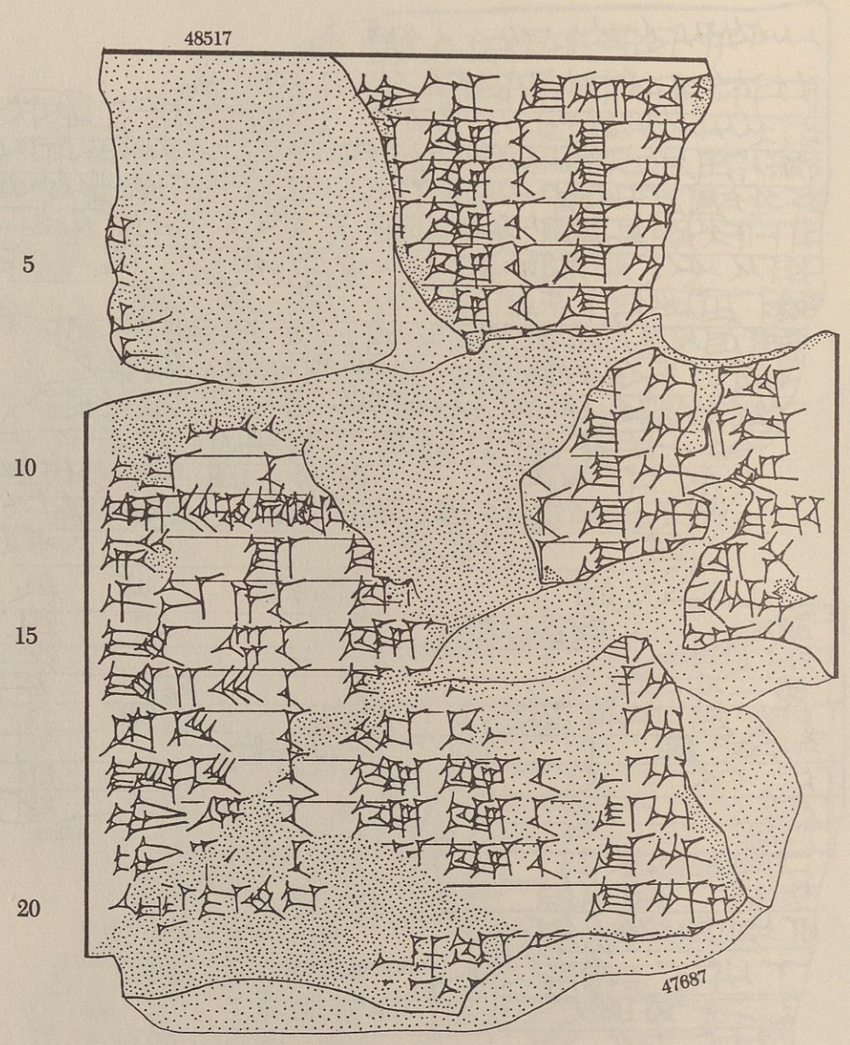
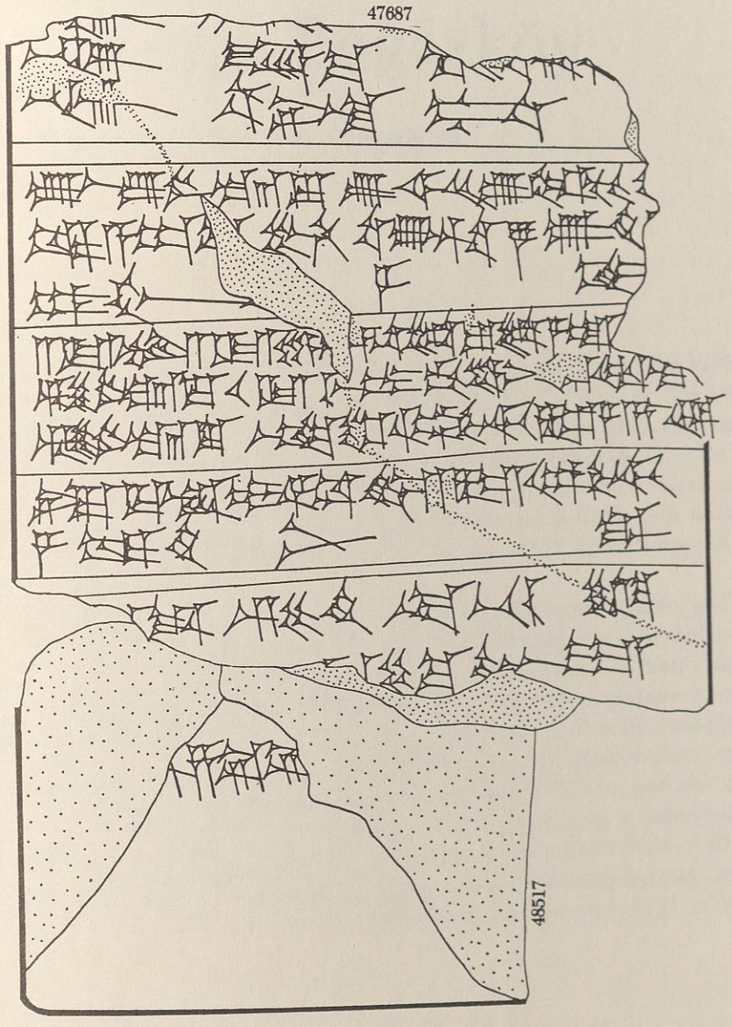


FIG. II. BM 47687+48517

Reverse



Bilingual Moon Omens From Boğazköy

HANS G. GÜTERBOCK

The Hittite version of a collection of omens pertaining to the horns of the moon has long been known.[1] Laroche lists it in his *Catalogue des textes hittites* of 1971 (*CTH*) as nr. 533.3 with three copies: A = KUB 8.6, B = KUB 29.11, and the small fragment C = KBo 13.21. Of these, C was found in the debris of the so-called "House on the Slope" in square L/18 of the city plan. The find spot of A, from Makridi's excavations 1906-11, is not known, but since he worked in the same building in 1911, it is possible that it came from the same collection as C. Copy B, however, was found in 1936 on Büyükkale in Building C, near the western edge of the acropolis (it could ultimately belong to Archive A).

In both copies A and B the Hittite text is written in the right-hand column, and since the horizontal lines separating paragraphs run across the intercolumnial, it is clear that both tablets were bilinguals. Part of the Akkadian version of copy B was found, again on Büyükkale, in 1962. The fragment bearing the field number 1026/u is now in the Ankara Museum as are copies B and C, while copy A is in Istanbul. That 1026/u is actually a part of copy B, directly joining KUB 29.11, was obvious on first sight and is proven beyond doubt by the fact that the colophon runs through the entire width of the reverse. As stated in *RHA* 22/74 (1964) 109, I noticed the "join" upon receipt of the photographs of the 1962 expedition. Prof. Otten saw it independently and communicated it to the late K.K. Riemschneider, who was preparing an edition of all Boğazköy omen texts. This work was never published, and to the best of my knowledge there are no plans to publish it posthumously.[2] A copy of Riemschneider's manuscript is kept in the Oriental

1. Abbreviations are those listed in H.G. Güterbock and H.A. Hoffner, eds., *The Hittite Dictionary of the Oriental Institute of the University of Chicago* (*CHD*) and J. Friedrich and A. Kammenhuber, *Hethitisches Worterbuch* (2nd ed., = *HW*²).

2. Riemschneider's edition of the Hittite fragments of the series *šumma izbu*, on the other hand, was published: *Babylonische Geburtsomina in hethitischer Übersetzung*, (StBoT) 9 (1970). Some Akkadian fragments of that series from Boğazköy are given in this publication; they are listed by Laroche, *RHA* 30 (1972) 112f., nos. 538, 540. E. Leichty included all Akkadian Boğazköy fragments of the series then known in his volume *The Omen Series šumma izbu*, TCS 4 (1970), pp. 207-210. Since then a Hittite fragment in old script was published as KBo 25.2.

Institute; I was allowed to consult it. Prof. Otten kindly gave the permission to publish the Akkadian text of the joined tablet here. Its inclusion in the official KBo series is planned for a later volume.

I showed the first draft of the present paper to Erica Reiner, who had earlier shown me some similar texts known to her through her work on the series *Enuma Anu Enlil*. Now (February 1987) she has found a close parallel to the Akkadian Boğazköy text among the recently published texts from Meskene-Emar.[3] I am indebted to Miss Reiner for the permission to utilize her find and for her help in interpreting the Emar text.

Of the Emar tablet only the lower part of the obv. and the upper part of the rev. are preserved with a total of 66 lines, of which the first ten and the last ten are badly mutilated. A considerable number of lines must be missing at the beginning and the end. All preserved lines contain omens of the moon. In the Boğazköy text the beginning and the end of the tablet are preserved; the parallel section of the Emar text, however, begins in the middle of the obv. after an undetermined number of other moon omens. A group of omens comparable to the last item in Boğazköy is in lines 53-56 of the Emar text. This means that the Boğazköy tablet with 59 omens corresponds roughly to Emar 7′-56′. It would seem therefore that the Emar tablet contained materials corresponding to three tablets of the size of the Boğazköy tablet. I am not competent to pursue this problem, nor is it necessary for the purpose of this paper to do so. Since the Emar tablet is only a close parallel but not a real duplicate to our text, I have not entered its readings and the restorations resulting from it in my transliteration, but rather discussed them in the commentary.

In the following transliteration the Akkadian column is given on the basis of photographs; I have not seen the original. For the Hittite column KUB 29.11 is used as main copy; restorations from the other copies are given in parentheses. In order not to change the sigla introduced by Laroche. I quote KUB 8.6 as A and KUB 13.21 as C.

3. D. Arnaud, *Recherches au pays d'Aštata: Emar* 6/1. (Paris: Editions Recherches sur les Civilizations, 1985), ("Synthèse" no. 18), tablet no. Msk 731041 obv. 8-20 on page 121. Hereafter quoted as Emar with line number.

Transliteration

§1 1a [BE XXX . . . -ma SI ZAG-šú ke-pí] SI GÙB-šú e-ed [. . .]
2a [. . .] i-ka-mu - ⌜ú⌝
1b *ták-ku* ^{d}EN.ZU-*aš*[a)] *kap-pa-an-za nu* ZA[(G-*an* SI-ŠÚ)] *al-pu*
2b SI GÙB-*la*[b)]-*ma-aš-ši dam-pu* ^{lú}KÚR [(KUR-*e*)] *e- e*[(*p-zi*)]

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§2 3a [BE XXX . . . -ma SI] GÙB-šú ke-pí SI ZAG-šú e - ed
4a [. . . -k]a MUD ta-za-az - za
3b *ták-ku* ^{d}EN.ZU-*aš*[a)] *kap-pa-an-za nu* SI GÙB[c)] ⌜*al-pu*⌝ SI ZAG[d)]-*ma*[(*-aš-ši*)]
4b *dam-pu* Á-*NA* KUR ^{lú}KÚR-*KA za-ak-ki-ia-aš i-wa-ar ti-ia*[-*ši*[e)]]

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§3 5a [BE XXX SIG$_7$-ma S]I ZAG-šú ke-pí SI GÙB-šú e - ed
6a [. . . ša]⌜2⌝ MU Ù.EBUR IGI
5b *ták-ku* ^{d}XXX-*aš*[f)]SIG$_7$-*wa*[g)]-*an-za nu* ZAG-*an* SI-ŠÚ *al-pu* SI GÙB[h)]-*ma dam-p*[*u*]
6b MU.2.KAM *ḫa-me-eš-ḫa-an-za* SIG$_5$-*at* - *ta*

---

§4 7a [BE XXX SIG$_7$]-ma SI GÙB-šú ke-pí SI ZAG-šú e - e[(d)]
8a [. . . š]a [2 M]U Ú.EBUR [IGI]
7b *ták-ku* ^{d}EN.ZU-*aš*[i)] SIG$_7$-*wa*[j)] *-an-za nu* SI GÙB[k)] *al-pu* SI ZAG-*ma-aš-ši*
8b *dam-pu* MU.2.KAM *ḫa-me-eš-ḫa-an-za* SIG$_5$-*at* - *ta*

---

§5 9a [BE XXX SI ZA]G-šú AN IGI EBUR nap-ša KUR K[Ú]
10a (blank)
9b *ták-ku* ^{d}XXX ZAG-*aš*[l)] SI-ŠU *ša-ra-a ne-pí-ši ne-ia* - *an*
10b *mi-ia-an-ta*[m)]-an EBUR KUR-*an-za ka-a-ra* - *pí*

---

§6 11a BE XXX SI ZAG-šú KI IGI EBUR KUR TUR [-ir]
11b *ták-ku* ^{d}XXX SI ZAG-ŠÚ GAM KI-*i ne-ia-an*[n)] KUR-*e-aš*[o)] EBUR-*aš te-ep-ša-u-e-eš-zi*[p)]

---

a) A: ^{d}XXX throughout the text.
b) A adds *-aš*.
c) A adds *-la*.
d) A adds *-ŠU-*.
e) A: *-zi*; see commentary.
f) A: ^{d}XXX.
g) A omits *-wa-*.
h) A adds *la-*.
i) A: ^{d}XXX.
j) A omits *-wa-*.
k) A adds *-la* above the line.
l) A: ZAG-*an*.
m) A: *-da-*.
n) Text *-aš*; A correctly *-an*.
o) A: KUR-*ia-aš*.
p) A: *te-pa-u-e-eš-zi*; see commentary.

§7 12a BE XXX SI GÙB-šú AN IGI TI.LA.ḪI.A AŠ KU[R . . .]
12b *ták-ku* ^{d}XXX SI GÙB-*ŠÚ* UGU AN-*i ne-ia-an* ŠÀ KUR-*kán*$^{q)}$ TI-*tar ki-ša*

---

§8 13a BE XXX SI GÙB-šú KI IGI ÚŠ.MEŠ AŠ KUR[ ]
13b *ták-ku* ^{d}XXX SI GÚB-*ŠÚ* GAM KI-*i ne-ia-an* ŠÀ KUR-*kán*$^{r)}$ ÚŠ-*kán ki-ša*

---

§9 14a BE XXX AŠ na-an-mu-ri-šu$^{s)}$ SI-šú x[. . .]
15a ŠUB URI.KI [. . .]
14b *ták-ku* ^{d}XXX *a-ut-ti nu* SI-*ŠÚ A-NA* IM.GAL *ne-i*$^{t)}$*-ia - an*
15b ⌜*(na-at ta-lu)*⌝*-ki-iš-ša-an*$^{u)}$ KUR A-*ga-ti*$^{v)}$ KUR NIM.KI-*ia a-k[(i)]*

---

§10 16a BE XXX AŠ na-an-mu-ri-šu$^{w)}$ S[I-šú . . .]
17a URI.MA ^{lú}KÚR [. . .]
16b [*(ták-ku* ^{d}XXX *a-u)t-ti nu* S]I-ŠU ^{im}*tar-aš-me-ni ne-ia-an*$^{x)}$
17b [(LUGAL KUR ^{uru}A-*ag*)*-ga-ti* ^{lú}]KÚR *ḫar-ni-ik - zi*

---

§11 18a [B]E XXX AŠ na-an-mu-r[i-šu$^{y)}$ [. . .]
19a [^{lú}]KÚR MAN.ID(?) [. . .]
18b [*(tak-ku* ^{d}XXX *a-ut)-ti nu* SI-ŠU . . . *-n]i ne-ia-an*
19b [*(na)-at (ta-lu)-ki-iš-ša-an*$^{z)}$ . . . *(ku-i)]š-ki ku-en-zi*

---

§12 20a [BE] ⌜XXX⌝ AŠ na[-an-mu-ri-šu . . .]
21a lost
20b [*(ták-ku* ^{d}XXX *a)-ut-ti nu* SI-ŠÚ . . . *(ne-ia)*] - *an*
21b [*(na-at t)a-lu-ki-ša-an . . . pa(-aḫ-ḫur)] ki-ša*

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§13 (Akkadian version lost)
22b [*(ták-ku* ^{d}XXX) . . .] x x x [*(-an)*]$^{aa)}$
23b [*(ša-an-te)-eš* . . .]

---

§14 24b [*tá(k-ku* ^{d})XXX . . .
(Remainder of obv. lost in both copies)

q) A [KU(R-*i*)]*a-kán an-da*, restored from C 3.
r) A: KUR-*kán an-da*.
s) Wrong word division!
t) A omits *-i-*.
u) A: *ta-lu-kiš-zi*.
v) A: LUGAL KUR ^{uru}*Ag*[- . . .
w) Wrong word division!
x) A adds *na-at ta-lu-kiš-zi*.
y) Wrong word division!
z) Restored after 15b; A: *na-aš ta-lu*[- . . .
aa) KUB 29.11 breaks off.

Reverse:

1′ (traces only)
2′a BE XXX TÙR pí-ir-sú DIŠ ^{d}UTU.È.A p[a-ri-is . . .]
3′a ti-bu-ut IM.MAR.TU [. . .]
2′b (lost)
3′b [. . . *a-ra*] - *i*

Colophon:

4′ ŠU.NÍGIN 59 ŠID[.BI(.IM)]
5′ ṭup-pu [. . .]
6′ ŠU ^{m}Pí-ik-ku DUMU ^{m}Ta-at-ta pa-ni ^{m}A-nu-wa-an-za LÚ.SAG iš-ṭur

Translation

§1

(Akk) [If the moon is . . . and its right horn is blunt], its left horn is pointed: [. . .] (they) will capture.
(Hit) If the moon is . . . and its right horn is pointed, but its left horn is blunt: the enemy will seize the land(s).

§2

(Akk) [If the moon is . . . and] its left horn is blunt, its right horn is pointed:
(Hit) If the moon is . . . and its left horn is pointed, but its right horn is blunt:
(A/H) you will take a stand at the land of your enemy like a door bolt.

§3

(Akk) [If the moon is yellow and] its right horn is blunt, its left horn is pointed: [. . .] will see spring of two years.
(Hit) If the moon is yellow and its right horn is pointed, but its left horn is blunt: for two years the spring will be good.

§4

(Akk) [If the moon is yellow] and its left horn is blunt, its right horn is pointed: [. . . will see] spring of two years.
(Hit) If the moon is yellow and its left horn is pointed, but its right horn is blunt: for two years the spring will be good.

§5

(Akk) [If the moon's ri]ght horn faces the sky:
(Hit) If the moon's right horn is turned up to the sky:
(A/H) the land will consume an abundant harvest.

§6

(Akk) If the moon's right horn faces the earth:
(Hit) If the moon's right horn is turned down to the earth:
(A/H) the harvest of the land will diminish (var. dry up?).

§7

(Akk) If the moon's left horn faces the sky:
(Hit) If the moon's left horn is turned up to the sky:
(A/H) recovery will occur in the land.

§8

(Akk) If the moon's left horn faces the earth:
(Hit) If the moon's left horn is turned down to the earth:
(A/H) pestilence will occur in the land.

§9

(Akk) If the moon, upon becoming visible, its horn [. . .]: downfall of Akkad [and Elam (?)].
(Hit) If you see the moon, its horn is turned toward the south and is extended: (var.: the king of) Akkad and Elam will die.

§10

(Akk) If the moon, upon becoming visible, [its] ho[rn . . .], Akkad [will destroy] the enemy.
(Hit) If you see the moon and its horn is turned toward the north (var.: and is extended), the king of Akkad will destroy the enemy.

§11

(Akk) If the moon, upon becoming visible, [. . .]: [the en]emy . . . [. . .].
(Hit) If you see the moon, [and its horn] is turned toward [the east] and is extended: someone will kill [. . .].

§12

(Akk) If the moon, upon be[coming visible . . .]: (apodosis lost).
(Hit) If you see the moon [and its horn] is turned toward [the west] and is extended: [. . .] fire will occur.

§13

(Hit) If the moon [. . .]: the angr[y gods will return to the land . . .].

§59

(Akk) If the moon's halo is di[vided] into sections toward sunrise: rise of the west wind [will occur].
(Hit) (Protasis lost), [. . .] will rise.

Colophon:

Total: 59 items [. . .]
tablet [. . .]
Written by Pikku, son of Tatta, under Anuwanza, the eunuch.

Commentary

§§*1-4* a. The writing of "moon": The Akkadian column writes the figure "thirty" without determinative throughout (preserved in 11a ff. and rev. 2a). The Hittite column of the same tablet writes ^{d}EN.ZU-*aš* (1b, 3b, 7b), ^{d}XXX-*aš* (5b), but ^{d}XXX without complement from 9b on as far as preserved, and so do both duplicates. The Hittite reading is well known as *armaš* (cf. *HW*^{2} s.v.).

b. The predicates describing the moon: In the Akkadian col. these predicates are lost in all four sections. For the first, Emar 8′-9′ has a sign not identifiable from the hand copy. In the Hittite version the moon is *kappanza* in §§ 1-2, and SIG$_{7}$-(*w*)*anza* in §§3-4. This is the color adj. SIG$_{7}$ = -(*w*)*arqu*(*m*) "yellow, green" (*CAD*; *AHw* gives "gelbgrün") with a Hittite phonetic complement; as shown by Riemschneider (*MIO* 5 [1955] 146), the full reading is *ḫaḫlawant-*.

For *kappant-* Riemschneider (*BiOr* 18 [1961] 25) adduced the beginning of the fifth tablet of the series *Enuma Anu Enlil* from the so-called Uruk catalog (Weidner, *AfO* 14 [1941-44] 186 and pl. I): *šumma Sin ina tāmarti-šú a-dir-ma qaran imitti-šú ki-pat qaran šumēli-šú ed-de-et*. From this he deduced the meaning "dark" for *kappant-*. The *CAD* s.v. *adāru* A gives "to become obscured (said of heavenly bodies)," while the *AHw* says "finster sein" with more examples concerning the moon etc. Independent evidence for Hittite *kappant-* is scarce. In an *izbu* omen one reads: "If a freak's ears are *kappanda*" (KUB 8.83:10; Riemschneider, StBoT 9:57f.). The sequence [. . .] *ḫarki kappanza* NINDA(?) x[. . .] KBo 15:31 i 2 is hard to understand because *ḫarki* "white" is in the neuter form while *kappanza* is gen. com., and the context is so fragmentary. If the reading NINDA is correct, "bread that is *kappanza* with regard to the white" might be a possible construction. A combination of the duplicates KBo 15.48 i 6-8 and KBo 23.28 i 7f. yields: [. . . (*nammaš*)]*ši* 1 TÚG SA$_{5}$ [. . . (x-*aš* SA$_{5}$)] *kappandan* [. . .]-*zi*, where it looks as if *k*. modified the color "red." Puhvel, *BiOr* 38 (1981) 353 correctly remarked that the moon could hardly be "dark" or "black" if its horns were visible (except in an eclipse, we would add), and proposed "diminished, waned" for *k*. In a similar way I thought of "pale". The ears of the animal fetus could be "pale" as well as "dark", and the color "red" could be modified by "pale" as well as by "dark". The contrasting description of the moon as "yellow" (preserved in Hittite version and in Emar) is not the logical opposite of either "dark" or "pale", although one could argue that a yellow moon is brighter than a pale one. However, this argumentation is doubtful for the following reasons: (1) Very little of the fifth tablet of the canonical series is known beyond the incipit listed in the catalog tablet of the Seleucid period; and (2) there are other tablets dealing with different colors

of the moon and with its horns. In an unpublished text made available to me in transliteration by Erica Reiner (BM 38289, also Seleucid) the moon is "red" (SA_5) in the first four lines and UD in line 5, that is *peṣû* "white", while of its horns one is *kepât*, the other *eddet* and looking either up or down. So this might be another version of the fifth tablet. But one should not use this parallel to equate *kappant-* with SA_5, because Hittite has already a word, *mita-*, for "red" and because in one of the examples *k* stands beside SA_5 (DIR and SA_5 being the same sign, one wonders whether *a*-DIR might be a mistake for SA_5- or vice versa).

c. The right and left horns: Akkadian *qarnu* "horn" is normally feminine (*CAD*), but in this kind of omens both genders occur: cf. the masc. forms *kepi* and *ed* here and in Emar 11′ as against *kepât* and *eddet* in the Uruk catalog. In line 1a of our text there is a break after *e-ed*. Since all other lines are carried to the right end of the column one is tempted to restore here *e-ed*[*-de-et*], but since this would be the only fem. form in our text it is safer to assume that this one line ended before the column divider.

The Hittite word for "horn", *karauwar*, is neuter, and the form of the predicates, *alpu* and *dampu*, is in agreement. Of the attributes "right" and "left", "right" is in the neuter form ZAG-*an* (*kunnan*) in line 1b (in the duplicate) and 5b, but ZAG without complement in lines 3b and 7b. "Left" appears as endingless neuter of an *-a* stem, GÙB-*la* (the Hittite reading is still unknown) in lines 2b and 3 and 5 of the duplicate, with the *-la* added above the line ibid. 7; without complement in 3b, 5b, and 7b. In line 1 the duplicate writes GÙB-*la-aš*, which may be the genitive "of the left (side)" but may also be a simple mistake just as *naš* for *nat* in 19.

As for the expression of the possessive relation, lines 5b and dupl. 1 and 5 write ZAG-*an* SI-*ŠÚ* where the right horn is first. Where the left horn comes first, the possessive is not expressed at all. The statement about the second horn is introduced by the adversative enclitic *-ma* "but", followed by the enclitic pronoun *-ši* "to him" which is the normal expression of possession in later Hittite: 2b, 3b (restored from dupl.), 7b; in 5b with dupl. it is omitted. In line 3 the duplicate combines the spoken *-ši* with the (merely graphic) Akkadogram (cf. *CHD* 3/2:222a).

d. The predicate describing the horns: For *kepi*, *CAD* has *kepû* v. "to bend, blunt" with preferred translation "blunt" when referring to the horns of the moon; *AHw* gives only "beugen" (bend); *edēdu* is defined as "to be pointed" by both dictionaries.

The Hittite equivalents *alpu-* and *dampu-* have been much discussed. Laroche, *RHR* 148 (1955) 14 proposed *alpu-* "lisse (smooth)", *dampu-* "rugueux (wrinkled, rough)". Holt, *Fs. Friedrich*, pp. 213-216 preferred "klar (clear)" for *alpu-*, "unklar, trübe (dull, dim)" for *dampu-*, offering etymologies by comparing *alpu-* with Latin *albus* and *dampu-* with German *Dampf*, English *damp*. Both authors wrote without knowledge of an Akkadian prototype. It was Riemschneider, *BiOr* 18 (1961) 25f., who adduced the first line of the fifth tablet of the series *Enuma Anu Enlil* as listed in the so-called Uruk catalog (Weidner, *AfO* 14 [1941-44] 186 and pl. I, line 5) with the sequence *kepât—eddet* "blunt — pointed" which would make *alpu-* "blunt" and *dampu-* "pointed". When the word *alpuemar* turned up in KBo 11.14, Laroche responded, *OLZ* (1963) 246, that for *alpu-* "lisse, brilliant" seemed better than "émoussé (blunt)". In 1976 I discussed the two adjectives and their derivatives in *RHA* 74 (1976) 98-100. I proposed to reverse the distribution, making *alpu-* "pointed" and *dampu-* "blunt". One reason was my feeling for the "Gestalt" of the two adjectives: *dampu-* "pointed" simply did not sound right in an Indo-European language. Concretely I based my argument on the word *alpuemar*, of which in KBo 11.14 i 12-14 a little is cut off horns and put on a loaf of bread (see below). While my article was in the press I found the "join" of the Akkadian and Hittite columns of our text. In an addendum (*RHA* 74 [1976] 109) I conceded that the evidence of the bilingual contradicted my proposal but

added that "I still do not see how it should be possible to cut off a little bluntness of a horn and put it on the bread." I therefore considered the possibility that the Hittite translator had mixed up the two Akkadian words.

Such an iconoclastic view was —of course—rejected by other Hittitologists. Kümmel, *Or*NS. 36 (1967) 367, followed von Soden, *AHw*, in translating *kepû* not as "blunt" but rather "gebogen, krumm, rund (bent or curved, crooked, round)", hence, *alpuemar* "Krümmung, Rundung, Bogen (curvature, roundness, arc)". While one might possibly cut, or rather shave off, small parts from the curve of a horn, how do the proposed meanings fit the horns of the moon? They are curved permanently; they can hardly be crooked; they could be rounded at the end, but that is the same as blunt.

Kammenhuber, *HW*² Lieferung 1 (1975) 61b took the easy way out by denying any connection between *alpuemar* and *alpu-* . Her doubts concerning the word formation were shown to be unfounded by Puhvel, *RHA* 33 (1975 [1977]) 59-62. He correctly posits (p. 60) a stative verb in *-e-* of which *alpuemar* is the verbal noun. Thus *alpue-* and *alpueš-* form a pair of stative and inchoative verbs of the kind discussed by Watkins, *Transactions of the Philological Society* 1971 (1973) 51-93, esp. 72ff.

The passage KBo 11.14 i 12-14 reads: Ù *ANA* GUD APIN.LAL-*kán ḫuišwanti* *ANA* SI.ḪI.A-*ŠU* *alpuemar tepu kuranzi nukan apēya anda* *ANA* NINDA.KUR$_4$.RA *dāi*. My translation (*RHA* 74 (1976) 99) is: "One cuts a little (of the) *alpuemar* off the horns of a live plow-ox, and he puts these, too, on the thick loaf" (together with other objects put on the same loaf before); I then added that *alpuemar* must be "the point." Puhvel translates "on a living plow-ox they cut a little blunting into its horns," and adds in parenthesis "(i.e. they trim off some of the point)." This is unacceptable for two reasons: (1) He does not recognize the dative of separation, best known in Hittite from *dā-* with dative "take from someone" and attested for *kuer-* and *karš-* (both "to cut") in 2 Mast. i 31-35 (Rost, *MIO* 1 [1953] 350f.), nor the fact that *ANA* GUD . . . *ANA* SI.ḪI.A is a *skhema kath holon kai meros* "cut from the horns of the ox". (2) *apēya* "these too" of the next clause (left out by him!) would remain without antecedent, since the "bluntness cut into the horn" obviously cannot be it.

Concerning the other occurrences of *alpuemar*: The vocabulary KBo 1.42 iii 45 is now available in MSL 13 p. 139:185 and *CAD* S p. 165f. s.v. *sappartu*. One may suspect that the *CAD*'s rendering "tip of an animals horn" was influenced by my translation, but the examples quoted from Akkadian texts give independent evidence for "point" (the bilingual evidence on which the *AHw* bases its translation as "Kopffell" is interpreted differently by the *CAD* S s.v. *sappāru*). The passage from KUB 17.25 with dupl. 26 (*CTH* 454 belonging to 405), quoted *RHA* 74 (1976) 100, is not decisive because it is not clear how a cord tied to a horn is meant to "replace" (*ḫapuš-*) the *alpuemar* of the horn. KUB 33.33:14 is too fragmentary to be of use; Puhvel's (*RHA* 33 [1975] 60) combination of *alpuemar* with the following (!) gen. GUŠKIN-*aš* is hardly correct. 222/b right col. 4 (Otten, ZA 66 [1976] 100) ŠA GÍR *alpue*[*mar*] may well be "the point of the dagger" (Otten: "Krümmung").

For the adjective *alpu-* the passage KUB 27.67 iii 67-70 (*RHA* 74 [1976] 100, citing Goetze, *ANET*, p. 347b) is important. "When he returns home he takes an *eya*-tree: above it is covered with foliage (or needles) (*warḫui-*) and below it is *alpu-*. He rams (*walḫzi*) it in on the right of the first door." Obviously in order to ram a tree into the ground its lower end should be pointed (Goetze, "trimmed"), not blunt or bent! (Puhvel, *RHA* 33 [1975] 60 again omits the last clause).

The passage KBo 16.25 i 35′-39′ (46′-50′ cumulative with KBo 16.24) seems to contradict my interpretation (cf. *HW*² 61 s.v. *alpueš-*). However, there was more space on the left from the lost

edge of the tablet to the first preserved signs than suggested by the dotted line in the hand copy.[4] This allows for the restoration of the negation *lē* before the verb in line 38′. The passage now reads:

35′ [*andam*]*aššan kuiš kururi parā galankanza nu kiššan*
36′ [*imma*ʔ *t*]*ezzi manwa ini kurur arḫa ḫarkzi nu kiššan*
37′ [(*imma t*)]*ezzi manwa ini* [*kuru*]*r*(ʔ)
38′ [*le*(-ʳ*e*ˡ *a*)]*l-pu-e-eš-zi* [*nu*] *apūn kē* NÍŠ DINGIR.MEŠ *appandu n*[*an* QADU]
39′ [DAM-ŠU] DUMU.MEŠ-ŠU *ḫarninkandu*

"[Furthermore] whoever is friendly to the enemy and [even (?)] speaks thus: 'I wish that this war will disappear!' and even speaks thus: 'I wish that this [war (?)] will [no]t become sharp/pointed/accute!'—let these divine oaths seize him and destroy him [together with his wife] and children!"

A restored negation is not proof, but neither does an incomplete text prove the opposite.

As a counterpart to the verb *alpueš-* there is also *dampueš-*. The only occurrence, KUB 33.63 obv. 4-6, is too mutilated to be of help; cf. *CHD* 3/3 s.v. *mukrit* (with "become pointed/sharp").

Finally, I cannot follow the tour de force by which Puhvel (*RHA* 33 [1975] 61f.) tries to save Popko's comparison (*JCS* 26 [1974] 182) of *dampu-* with Slavic words for "blunt." Assuming that *dampu-* meant originally "rough" in the sense of "in the natural state, untreated," Puhvel goes on one side via "prickly, sharp" to Hittite "sharp, pointed," on the other from "uncouth, obtuse" to "dull, blunt"!

As a result of this long discussion I must return to my original definition of *alpu-* as "pointed" and *dampu-* as "blunt" and to the explanation of the contradicting evidence of our bilingual as the mistake of a Hittite translator who knew in general that *kepû* and *edēdu* referred to pointed and blunt appearance of the horns, but did not remember which was which. The principle that one should take the text as given is fine as long as it works, but when it leads to such forced interpretations as those discussed above one is allowed to assume a mistake.

e. The apodosis of §2: Hittite *zakki-* (4b) is "door bolt", often written with the determinative URUDU (beside rarer GIŠ: cf. Otten, *Bagh. Mitt.* 3 [1964] 93). The verb *tiya-* "to take a stand, to step (somewhere)" is in the 3rd sg. pres. *tiyazi* in the duplicate. In our main copy the last sign is lost. Because of the 2nd sg. form *tazazza* in Akkadian 4a we prefer to restore it as 2nd sg. *ti-ia*[*-ši*] in 4b. "You will take a stand at the land of your enemy like a door bolt" could be a figure of speech meaning "block the enemy's approach".

In the Akkadian version, the first fully preserved sign must be MUD, as Riemschneider has seen. Normally this sign has the shape of ḪU+ḪI, also in Boğazköy; but the shape seen here, with 3+2 oblique wedges instead of ḪI, occurs at least once more: KUB 6.39 obv. 6. In all Boğazköy occurrences except ours MUD stands for "bloodshed". In our omen apodosis the rendering by Hittite *zakki-* shows that at least the Hittite translator must have thought of the logogram $^{\langle giš\rangle}$MUD which designates some device for securing a door. Its Akkadian reading is *uppu*. According to Kilmer, *Finkelstein Mem.*, pp. 130ff. with fig. 1 (followed by *AHw uppu*(*m*) 1.1), it is the socket into which the door bolt fits, but the Hittite scribe must have taken it for the door bolt itself (just as earlier interpreters have defined it as part of a locking device). The sign preceding MUD seems to be part of *ka*, corresponding to the *-KA* in the Hittite version. In Emar 9′ most of the apodosis is lost.

4. This was observed by H.A. Hoffner upon collation. It is also shown by the following restorations taken from a small unpublished duplicate, 256/w; recognized by H. Berman; KBo 16.25 i 31′ [(*nu ma-a-an* ER)]ÍN.MEŠ-*an* (256/w 2′) 32′ [(ˡᵘ́UGULA *LI-I*)]*M* (256/w 3′), and the]A (256/w 4′) will be the end of the *-e* restoring line 38′. Compare also the space needed for the obvious restoration [*nu-uš-ma*]-*aš* in line 40′. In 35′ I follow Hoffner in restoring [*an-da-ma*]-*aš-ša-an*; cf. *andama* KBo 16.24 ii 7′, restoring 25 I 23, and *CHD*, 9b.

f. The apodosis of §§3-4. It is strange that in the Hittite version both omens have the same favorable outcome. One expects one of them to be unfavorable. In the Akkadian version the beginnings of both lines 6a and 8a are lost, so one could restore "the land" in one, "the enemy" in the other. In §§1-2 the first is unfavorable, whereas in the following pairs, §§5-6, 7-8, 9-10, the favorable omen is first. As a result it cannot be determined whether one should restore *mātu* or *nakru* first—if indeed the Akkadian version had contrasting apodoses.

In the Emar text both apodoses (10′-11′) end with *i-zi-bu-ši* "they will abandon it (fem.)"; cf. the examples in *CAD* E 417b, where "the gods will abandon the land." This phrase occurs in a later part of the Emar text: KUR DINGIR.MEŠ-*ša i-zi-bu-ši* (23′b), but in line 11′ the signs preceding the verb are different: they look like DIN or KUR! MU.3.ḪI.Aʔ, which I cannot explain. In line 10′ there is a lacuna.

The correspondence of Ú.EBUR = *dīšu* "spring" with Hitt. *ḫamešḫanza* of the same meaning is a welcome confirmation of Landsberger's interpretation of *TE-ŠI* in Hitt. texts as syllabic spelling of *dīši* (apud Friedrich, *HW*, p. 222).

§§5-8 a. The logograms AN IGI and KI IGI stand for *šamê*/*qaqqara inaṭṭal* "looks at, faces the sky/earth". The Hittite version renders the verb by the participle "is turned" and adds a redundant "up" and "down" respectively.

b. §§5-6: Emar 12′-13′ duplicate our text verbatim, except that *i-k*[*al*] and *i-še-eḫ-ḫi-ir* are written out. In §§7-8, Emar 14′-15′ have a better rendering of the apodoses: *ba-la-ṭu* AŠ KUR Ì[.GÁL] and *mu-ta-nu* AŠ KUR Ì.GÁL. In addition to supplying the verb *ibašši* (which one would have restored anyway) it writes *balāṭu* for the strange TI.LA.ḪI.A and confirms that ÚŠ.MEŠ stands for *mutānu*. The Hitt. words *ḫuišwatar* (TI-*tar*) "life" and *ḫinkan* (ÚŠ-*kán*) "death" but also "pestilence" correspond well.

c. In §6 the verb of the apodosis differs in the two Hittite copies: *tepaweššzi* of the variant is the inchoative verb from *tepu-* "little, scarce", while the bilingual has the same kind of verb derived from the adj. *tepšu-*, which has been much debated. While Sommer (*HAB* 141f.) and Gurney (*AAA* 27 [1940] 107f.) take it as synonymous with, and ultimately related to *tepu-*, Weitenberg (*Die heth. U-Stämme*, pp. 200f) rejects this connection and (modifying Goetze's "sterile") posits "dry" as the basic meaning of *tepšu-*. "The harvest of the land will diminish" and "will dry up" are not too far from each other. It is noteworthy, however, that the bilingual offers the equation TUR[*-ir*] (*išeḫḫir*) = *tepšaweššzi*, which is in favor of Sommer's and Gurney's view.

§§9-12 a. The scribe responsible for the Akkadian column of our tablet obviously did not understand *ina nanmuri-šu*, because he divided the signs as if he read *ašnan murišu*. However, the translator did understand the phrase "on its being sighted" correctly and translated it by "if you see the moon".

b. The actual observation is lost in all four sections of the Akkadian version. In the Hittite, the scheme in all four is "and its horn is turned toward . . . " The word designating the direction begins with IM "wind" in §§9 and 10 while it is lost in §§11 and 12. One expects here the four winds after which the Babylonians named the cardinal points. Indeed all four are preserved in the Emar text, 16′-19′: DIŠ IM.GÀL.LU GÍD.DA followed by IM.SI.SÁ, IM.KUR.RA and IM.MAR.TU. It follows that IM.GAL (with GAL_1) in the Hittite version is indeed the phonetic rendering of IM.GÀL(.LU), as noted by Hoffner, *JAOS* 87 (1967) 357 and *RHA* 25/80 (1967) 35 n. 44, which shows that the Hittite scribes did not know the Sum. reading U_{19} of the URU sign. Line 17b must contain the Hittite word

for "north", albeit in a spelling that poses problems. Ehelolf's hand copy suggests *tar-aš-me-ni*, which could also be read as *haš^{aš}-me-ni*, as Laroche, *RHA* 12/54 (1952) 22 pointed out. On the photograph it looks as if only *tar-me-ni* were intended, with the second horizontal of *tar* repeated. This leaves the choice between *taršmena/i-*, *hašmena/i-*, and *tarmena/i-*. The final *i-* must be the dat.-loc. ending which may belong to an *-a-* or *-i-* stem. Also the Hittite name of the third wind "east" seems to end in *-n]i*.

c. The predicate in the Hittite version is expressed by two verbs, of which the second is in a short separate clause introduced by *nu*: "is turned (participle) toward the south, and it is elongated (participle in the main text, 3rd sg. pres. in the var.)." The Akkadian equivalent is lost in the Boğazköy bilingual, but preserved in Emar 16′-19′. It is simply GÍD.DA (*arik*) "is long," while the direction is expressed by the preposition *ana*: "is long toward the south etc." Most probably the Akk. column of the Boğazköy tablet had the same short expression.

d. The apodoses: in §9, the Hitt. says "Akkad and Elam will die". The variant, probably because of the verb "to die," adds "the king of." In the Akk. version only the first half of the line is preserved: *miqit Akkadi*, written ŠUB URI^{ki} "downfall of Akkad" with room enough for restoration of [*ù* NIM.MA^{ki}]. In Emar *miqittu* is written with the other logogram, RI.RI.GA, and URI is followed by a MA as in our line 17a. The traces thereafter do not seem to fit a restoration of "Elam", but it is hard to think of anything else.

In the Akkadian column of §10 only URI.MA ^{lú}KÚR is preserved. In the Hittite version the beginning of the line is supplied by the duplicate with "The king of Ak[kad]" like in §9; the verb is *ḫarnikzi*, the equivalent of *uḫallaq*. Emar 17′ reads URI.MA^{ki} ^{lú}KÚR-*šu* x[. . .]x, where the traces do not fit the expected *uḫallaq* or its logogram ḪA.A. This verb is preserved in syllabic writing in 7′, i.e. before the passage parallel to the Boğazköy text.

In §11 the Akkadian version after [^{lú}]KÚR, has an enigmatic group of two signs: MAN.ID or 20.Á or however it may have to be read. Emar 18′ writes ^{lú}KÚR KUR *i-da-ak* "the enemy will defeat the land". The Hittite version offers [. . .] *kuiški kuenzi* "someone will kill"; this may have been preceded by ^{lú}KÚR, making it "some enemy will kill".

In §12 Emar 19′ writes ^{d}BIL.GI KUR *i-ge-eš* "the Fire God will tear up (or: trample down) the land" (*AHw gêšu(m)* I "zerwühlen", *CAD* G *gêšu* "to gash" cf. *gêš qerbeti* in *CAD* Q s.v. *qerbetu* 2e "who trampled down the fields." (I am indebted to Erica Reiner for this reference). The Hittite version simply says "[in the land(?)] fire will occur."

In §13 the three signs preserved in the Hittite column in the variant, ŠA AN TE, may be restored to *ša-an-te*[*-eš* . . .] "angry" (nom. pl.) in the apodosis: "the angry [gods will . . .]" or the like. Emar 20′ confirms this restoration. It reads: BE XXX SI.MEŠ-*šu* AN IGI DINGIR.MEŠ *ze-nu-tum* DIŠ KUR *i-tu-ru-nim* KUR TUŠ *ne-eḫ-tam ú-ša-ab* "If the moon's horns faces the sky: the angry gods will return to the land; the land will dwell in security."

In the last paragraph of the tablet, rev. 2′a, I owe the reading TÙR to Riemschneider. The photograph is not clear, but Otten in his field copy draws traces that come close to TÙR. The only sign preserved in the Hittite version, *-i*, must be the end of a verb in the 3rd sg. pres.; [*ara*]*i-* offers itself as verbal expression of *tibûtu*.

The Emar text has omens about the halo of the moon in lines 43′-56′. Of these 44′-50′ begin: *šumma Sin tarbaṣa lami* "If the moon is surrounded by a halo," while 51′-56′ begin: *šumma ina libbi tarbaṣi* "If inside the halo . . ." Neither of these wordings exactly correspond to our line rev. 2′, but in both groups there are phrases similar to ours. Cf. Emar 49′: [BE XXX] TÙR *la-mi-ma* DIŠ IM.KUR.RA *pa-ri-is* "if the moon is surrounded by a halo, and it is divided toward the east" (the same wording recurs with all four cardinal points 47′-50′), and 53′: BE AŠ ŠÀ TÙR *pi-ir-su* 3 *pa-ri-is* *ti-bu-ut* IM.SI.SÁ "If inside the halo three sections are separated: rise of the south wind" (lines 53′-56′ list all four winds, with IM.MAR.TU as the last). It would seem that our line rev. 2′ is a conflation of Emar 49′ and 56′, basically following 56′ but omitting the number of sections and adding the direction from line 49′.

Colophon: For ŠID "numbers" in Boğazköy see Güterbock, *RHA* 25/81 (1967) 146-148 with n. 9. For the formula ŠID.BI(.IM) "is its number" cf. *minûtu* in both dictionaries. The number of 59 items or individual omens seems appropriate for the size of the tablet as far as it can be estimated. The contrast of this number to 131 listed in the Uruk catalog (above p. 167) once more demonstrates the changes such collections underwent over the centuries.

The scribe, Pikku, son of Tatta, and his supervisor Anuwanza are known from other colophons; see Laroche, *Les Noms des Hittites*, s. vv. and the same, *ArOr* 17/2 (1949) 10. They were active during the last years of Hattušili III and the reign of his son Tutḫaliya IV. This dates, of course, only the extant tablet. We saw that the correct understanding of *ina nanmurišu* attested a translator who worked from a correct copy. The use of *takku*, not *mān*, for "if" shows that the Hittite translation reflects an old tradition.

There is another fragment of an omen text dealing mostly with the horns of the moon, KUB 8.13 (*CTH* 533.5). The extant Hittite fragment is part of a right-hand column, so the tablet may have been bilingual. The protases run as follows: (5′) "If the moon's horns be[come] branches; (7′) If [there is] a branch at the moon's left horn; (9′) If a star stands at the moon's right horn; (10′) If a star stands at the moon's left horn; (11′) If stars stand at the right and left horn of the moon."

But the next two omens deal with different aspects: (13′) "If the moon becomes exceedingly brilliant(?), and (14′) If the moon becomes exceedingly little(?)." For these two lines and the problem of determining the meaning see *CHD* 3.3.299 s. v. *mišriwešš-*.

In other lunar omens from Boğazköy the horns are mentioned among different phenomena: Akkadian KUB 37.162 (*CTH* 532.1.2), a left column, and Hittite KUB 8.12 and duplicates (*CTH* 533.6), right columns in all copies; but in KUB 8.12 the lines are not running through, showing that this copy was not part of a bilingual.

These omen texts are offered to the memory of Abraham Sachs in the hope that they, in conjunction with the parallel from Emar, will help in the reconstruction of the text, or at least of the development of the series *Enuma Anu Enlil*.

The Nabonassar Era and other Epochs in Mesopotamian Chronology and Chronography

WILLIAM W. HALLO

We are accustomed to dating by eras[1]—whether the Christian era by the Anno Domini in common use, or the Moslem Era dating from the Higra (622 C.E.), or the Jewish Era of Creation (3761 B.C.E.). But this usage is a relative newcomer in the history of dating practices. The Christian era was introduced in the early sixth century C.E. by a monk, Dionysius Exiguus, living in Syria. It was preceded by various dynastic and provincial eras of more limited applicability, all of them modelled on the Seleucid Era, or rather various Seleucid Eras which go back to the fourth century B.C.E. (±312 B.C.E.). But that is as far back as the practice of continuous dating irrespective of reign or even dynasty can be traced. The Seleucid Era has a prototype of sorts that began more than four centuries earlier, but before this, very different methods were employed in Ancient Near Eastern historiography and chronography. On one view the curious avoidance of the use of a continuous era is based in part upon a cyclical rather than a linear concept of history.[2] On another, one might suggest that it took time to invent or evolve or simply to stumble upon the idea of an era that was not only continuous in time but also international in terms of space, and that its admitted advantages were bought at the cost of some conveniences inherent in older systems.

Of these, the earliest is the system of year names which designated each year by an outstanding event of the preceding year, selected and formulated by royal authority. This required a rather

1. This paper was prepared for delivery at the Institute for Advanced Study, the Hebrew University of Jerusalem, in the Summer of 1982. It is presented here without essential change as a tribute to the memory of Abraham Sachs. A shorter version of the paper was published (without documentation) as "Dating the Mesopotamian past: the concept of eras from Sargon to Nabonassar," in the *Bulletin of the Society for Mesopotamian Studies* 6 (1983) 7-18. A sequel to the paper has appeared as "The Concept of Eras from Nabonassar to Seleucus," in the Elias J. Bickerman Memorial Volume (*JANES* 16-17 [1984-85; appeared 1987] 143-151). In addition to the published literature, I have made grateful use of seminar papers by L.M. Berman (1977), R. Donian (1983), D.S. Rudin (1982), Y. Sefati (1974), and R. Westbrook (1974).

2. W.K. Simpson in Hallo and Simpson, *The Ancient Near East: A History* (New York, 1971), p. 195.

elaborate technique of royal proclamations at the beginning of each year [3] and the maintenance of cumbersome lists to aid in the identification of date formulas, but these very lists provide the modern historiographer with a potentially priceless outline of the sequence of significant occurrences in a given reign. The system is first attested in Early Dynastic and Old Kingdom Egypt (ca. 3100-2400 B.C.E.) from the so-called Palermo Stone, and was actually employed for dating texts.[4] It is next known from Syria, if the testimony of the Ebla texts (ca. 2500 B.C.E.) is to be credited on this point. By the end of the Early Dynastic Period (ca. 2300 B.C.E.), it is attested in Mesopotamia, although at first only sparingly. Alleged cases at Lagash[5] are almost surely to be interpreted otherwise; those at Uruk, Ur and Nippur[6] are more plausible but still do not suggest a fully institutionalized system. Neither do the isolated examples from the beginning of the Sargonic period that followed.[7] But under Naram-Sin, date formulas in both Akkadian and Sumerian became the norm throughout the empire[8] and remained such through the rest of the Early Bronze and all of the Middle Bronze Age in Mesopotamia (ca. 2300-1600 B.C.E.).

The Third Early Dynastic Period also witnessed the first Mesopotamian experiments with systems of dating by regnal years. At Mari, numbered years are attested together with named months in a pre-Sargonic text.[9] At Abu Ṣalabikh, the numbered year precedes the named month in the only attested example of a dated archival text.[10] At Lagash, "beginning with the reign of Enetarzi . . . the regnal years of the city governor are indicated at the end of the text using a ligature with vertical intersecting wedges."[11] At Zabalam[12] and, following its example, "at Umma, the ligature system was used not only for years, but also for months and days."[13] This in turn led to the system of numbering the years, months and days in Umma texts of the Sargonic period. At its most explicit, this system featured subscripts of the form 2 mu 5 iti 5 u_4, "second year, fifth month, fifth day"[14]; more commonly the day was omitted and such texts have therefore been designated as mu-iti texts.[15] The year referred to is that of the governor of Umma, not that of his Sargonic sovereign. But since these governors changed more frequently than the

3. Examples from the First Dynasty of Babylon have been collected by M.J.A. Horsnell, "The Grammar and Syntax of of the Year-names of the First Dynasty of Babylon," *JNES* 36 (1977) 283f. and n. 40, to which should be added N. Yoffee, "On Studying Old Babylonian History: a review article," *JCS* 30 (1978) 24 n. 21. Examples from the reign of Rim-Sin of Larsa and Rim-Anum of Uruk have been added by M. Stol, "Studies in Old Babylonian History," *Netherlands Archaeological Institute Istanbul* 40 (1976) 49.

4. K. Sethe, *Beiträge zur ältesten Geschichte Ägyptens* (= Untersuchungen zur Geschichte und Altertumskunde Aegyptens III, 1905), ch. 4: "Die Entwicklung der Jahresdatierung bei den alten Aegyptern," especially pp. 65-81.

5. G. Steiner, "Zwei Namen Eannatums oder Jahresnamen," *WO* 8 (1975) 10-21; differently D.R. Frayne, *The Historical Correlations of the Sumerian Royal Hymns* (2400-1900 B.C.) (Unpublished Ph.D diss., Yale University, 1981), p. 12.

6. A. Westenholz, "Early Nippur Year Dates and the Sumerian King List," *JCS* 26 (1974) 54-6; *Literary and Lexical Texts and the Earliest Administrative Documents from Nippur*, OSP 1 (= Bi.Mesop. 1 [1975]), pp. 115f.

7. H. Hirsch, "Die Inschriften der Könige von Agade," *AfO* 20 (1963) 5c; Frayne, *Sumerian Royal Hymns*, pp. 25f.; 31-36.

8. Hallo and Simpson, *The Ancient Near East*, 61f.; Hirsch, *AfO* 20 (1963) 22 (c); I.J. Gelb, Materials for the Assyrian Dictionary 2^2, p. 201; M.E. Cohen, "A New Naram-Sin Date Formula," *JCS* 28 (1976) 227-232; Frayne, *Sumerian Royal Hymns*, pp. 37-39.

9. M. Lambert, "Textes de Mari—Dix-huitième campagne—1969," *Syria* 47 (1970) 258f.; Gelb, *SMS* 1 (1977) 12.

10. Biggs, OIP 99 508 obv iv. Other archival texts, *ibid.*, nos. 490-515.

11. Frayne, *Sumerian Royal Hymns*, p. 11; cf. J. Bauer, *Altsumerische Wirtschaftstexte aus Lagash*, Studia Pohl 9, pp. 669f. for a partial list of dated texts from Early Dynastic Lagash.

12. M.A. Powell, "Texts from the Time of Lugalzagesi: Problems and Perspectives in Their Interpretation," *HUCA* 49 (1978) 9-13; cf. Hallo, "Zabalam = Ibzaikh," *RA* 74 (1981) 94f.

13. B.R. Foster, "New Light on the 'Mu-iti' Texts," *Or*NS 48 (1979) 155f.

14. Foster, *Umma in the Sargonic Period*, Memoirs of the Connecticut Academy of the Arts and Sciences 20 (1982), no. 31.

15. Foster, *Or*NS 48 (1979) 153-162 and *Umma*.

king,[16] and since their names are not included in the date, the system was vulnerable to confusion and soon enough abandoned.

The next system of dating attested in the Near Eastern sources is that by eponym, i.e. by a high official or other person designated to give his name to a span of time. In lower Mesopotamia this system appears as early as the texts from Shuruppak (Fara) which I take to be comtemporary with those from Ebla,[17] i.e. ca. 2500 B.C.E. Although the suggestion has been disputed in some quarters,[18] it is argued elsewhere that the notation *bala* NN at the end of numerous archival texts from Shuruppak (and Abu Ṣalabikh?)[19] represents a system of dating by eponyms. Because of the large number of personal names in what is thought to be a corpus of relatively brief time span, it is probable that the eponymous period represented is less than a year, perhaps only a month.[20] In Upper Mesopotamia, the eponymous system is indubitably attested from the beginning of the second millennium on. Here it goes by the Akkadian term *līmu* which, though not a translation of Sumerian *bala*, belongs like that to the semantic field of rotation, surrounding, or turn (of office).[21] It became the standard Assyrian dating system to the very end of Assyrian independence.

In Babylonia, the system of dating by year-names briefly gave way to an incipient era-system at the beginning of the 18th century. At some point in his reign, king Rim-Sin of Larsa introduced some kind of numerical dating system whose exact nature still eludes modern interpretation.[22] Then, halfway through his long reign of sixty years, he conquered the rival kingdom of Isin, and the event loomed so large in his eyes that he named the remaining thirty years of his long reign after it, thus inaugurating an "Isin Era" (1793-1763 B.C.E.). If his successor had continued the practice, a full-fledged era-system of dating would have been introduced in one Old Babylonian kingdom at least but as the dynasty ended with Rim-Sin, it will remain forever unknown whether that would indeed have been the case. In Larsa and certain other cities that fell to Hammurabi after his conquest of Rim-Sim, some scribes introduced a "Hammurabi Era" which, in imitation of Rim-Sin's Isin Era, called Hammurabi 31 "the year when Hammurabi became king (i.e., over Larsa)" and the following years "the second/third (etc.) year when Hammurabi became king," continuing thus for at least six years.[23]

Apart from these brief experiments, Babylonia, unlike Assyria, stubbornly clung to the cumbersome year-name system—with its concomitant requirements to promulgate each new date by royal authority and to memorize or maintain long lists of old dates—throughout the Old Babylonian period. Even the Kassites ruling the kingdom of Hana along the middle Euphrates in the 17th century employed the traditional system.[24] It was abandoned only after the dramatic fall

16. Foster, *Umma*, p. 156 for one possible scheme.

17. Hallo, "The Date of the Fara Period: a case study in the historiography of early Mesopotamia," *Or*NS 42 (1973) 228-238.

18. J. Krecher, *ZA* 63 (1973) 181-183, followed by D.O. Edzard *apud* E. Lipiński, ed., *State and Temple Economy in the Ancient Near East* 1-2, Orientalia Lovaniensia Analecta 5-6 (1979), p. 155 and note 9.

19. But see above, note 10.

20. Hallo, "A Sumerian Amphictyony," *JCS* 14 (1960) 88-114, citing S. Langdon, *Babylonian Menologies and the Semitic Calendars* (= Schweich Lectures) (1935) and T. Jacobsen, *The Sumerian King List*, AS 11, (1939). Already in 1922, L. Legrain had stated "the Sumerian name of the monthly period of time is: *bal*" citing "*bal-gub-ba* in lists of accounts" (presumably of neo-Sumerian date); cf. PBS 7, p. 7 and n. 2.

21. A.K. Grayson, *Assyrian and Babylonian Chronicles* (TCS 5) (1975), p. 196 n. 28 citing Kienast, *ATHE*, p. 4.

22. F.R. Kraus, "Ungewöhnliche Datierungen aus der Zeit des Königs Rīm-Sin von Larsa," *ZA* 53 (1959) 136-167; cf. Hallo "The Road to Emar," *JCS* 18 (1964) 85 n. 11. The example of UET 5 401 (Kraus, *ZA* 53 [1959] 156 no. 156) shows that the system antedates the Isin Era. See now also J.F. Robertson, "An Unusual Dating System from Isin-Larsa period Nippur," *Acta Sumerologica* 5 (1983) 147-161.

23. F.R. Kraus, "Nippur und Isin nach altbabylonischen Rechtsurkunden" *JCS* 3 (1949) 42f.

24. A. Ungnad, "Datenlisten," *RlA* 2, p. 192f.

of Babylon at the beginning of the 16th century, and the introduction (after a brief Sealand interlude) of Kassite rule there. It was not, however, replaced by the era-system but by the system of regnal years. In terms of simplicity, this system represents a step in the right direction, since it required nothing more than a checklist of successive reigns and their lengths and, for international purposes, a list of parallel reigns in neighboring kingdoms or "synchronistic king lists." The system prevailed in Babylonia for more than a millennium, gradually shedding the remaining vestiges of the older system, such as the use of "mu-ús-sa" formulas, while introducing new refinements such as the use of the "accession year."[25].

Against this background, what emerges as the ultimate "unit of account," the structural basis in Mesopotamian historiography? Two issues are involved here, one that of chronography, the other of ideology. They need to be considered separately before their mutual relation can be appreciated. In classical and ecclesiatical history, chronography is the "method of establishing time-intervals between events and between them and the present."[26] The term was first introduced into the discussion of Mesopotamian historiography by Grayson at my suggestion.[27] Here I would like to define it as the technique, or rather the sum of techniques, for converting methods of dating in contemporary usage into systems by which a culture renders account to itself of its past retrospectively. This defintion, of course, comes very close to Huizinga's definition of history (in the sense of historiography) in general.[28] In fact cuneiform literature has left us relatively little formal historiography that is not enshrined in chronographic texts. Even such genres as the royal hymns can be largely seen as expansions on the themes of more prosaic date formulas.[29] The pre-eminent pre-occupation of so much cuneiform literature with the figure of the king makes most of it automatically a potential source for the reconstruction of the past. And indeed the king is naturally the basic "unit of account" of all chronographic literature. But what concerns us here are the larger and largest units, for these will reveal the ultimate chronographic ideas involved. From this point of view, two concepts stand out, one the city and the other the family. (A third is represented by the Rulers of Lagash, a kind of polemic against the Sumerian King List and its deliberate slighting of the claims of Lagash and Larsa.[30] Apart from its essentially mythological introduction, its structural unit seems to be the personal deity of successive rulers. To the extent that such deities were considered the divine parent of the ruler, and thus changed only as the human family of the ruler changed, we may have here the nearest Mesopotamian conceptual equivalent to the "dynasty" in the strict sense demanded by Kraus.)[31]

25. J.A. Brinkman, "Mu-ús-sa Dates in the Kassite Period," *WO* 6 (1971) 153-156; Horsnell, "Mu-ús-sa Dates in the Kassite Period Reconsidered," *ZA* 65 (1975) 28-33.

26. E.J. Bickerman, *Chronology of the Ancient World* (London, 1968), p. 62; cf. generally pp. 62-78, 87-89; A.A. Mosshammer, *The Chronicle of Eusebius and Greek Chronographic Tradition* (Lewisberg, PA 1979).

27. Grayson, "Divination and the Babylonian Chronicles: a study of the rôle which divination plays in ancient Mesopotamian chronography," CRRAI 14 69 n. 4. Cf. also W.G. Forrest, "Two Chronographic Notes," *Classical Quarterly* 63 (1969) = NS 19 (1969) 95-110; W. Röllig, "Zur Typologie und Entstehung der babylonischen und assyrischen Königslisten," AOAT 1 (1969), p. 268 line 7.

28. See most recently Hallo, "Sumerian Historiography," in H. Tadmor and M. Weinfeld, eds., *History, Historiography, and Interpretation* (Jerusalem, 1983), note 7; previously Hallo, "Biblical History in its Near Eastern Setting: the contextual approach," in Evans, Hallo and White, eds., *Scripture in Context: Essays in the Comparative Method*, Pittsburgh Theological Monograph Series 34 (1980), pp. 6 and 20 n. 27.

29. Hallo, "The Cultic Setting of Sumerian Poetry," CRRAI 17 118f.; Hallo, in Tadmor and Weinfeld, eds., *History, Historiography, and Interpretation*, nn. 60f.; in detail Frayne, *Sumerian Royal Hymns*.

30. Hallo, "Toward a History of Sumerian Literature," AS 20 (1976), pp. 185 n. 30 and 199 n. 110. For the Lagash-Larsa connection see already *Early Mesopotamian Royal Titles: A Philologic and Historical Analysis*, AOS 43 (1957), p. 137.

31. Kraus, "Zur Liste der älteren Könige von Babylonien," *ZA* 50 (1952) 30 n. 2; cf. Hallo, "The Birth of Kings" in J. H. Marks and R. M. Snood, eds., *Love and Death in the Ancient Near East: Essays in Honor of Marvin H. Pope* (Guilford, 1987), pp. 45-52.

As Jacobsen already noted in his classic edition of the Weld-Blundell prism[32], the technique of date-formulas led naturally and inevitably to the creation of date lists covering an entire reign and even an entire dynasty.[33] The dynastic date lists, in turn, were easily abstracted to provide king lists which recorded, not the names of individual years, but only the numbers of date-formulas of each king, in other words, the length of his reign. Such king lists generally spanned two dynasties which were conceived of as wholly or partly successive: Ur-Isin,[34] Larsa-Babylon I,[35] Babylon I-Sealand I.[36]

The penultimate step was represented by the official or Nippur recension of the Sumerian King List, which listed in succession all the dynasties thought to have ruled lower Mesopotamia from the Flood to the fall of Isin. By prefixing to this list the antediluvian tradition found in other literary contexts, the ultimate step was taken toward a kind of official Mesopotamian chronography, which could only be challenged by resort to a kind of parody.[37]

The Sumerian King List was carefully and deliberately organized on the basis of cities. This is clear already from the structural elements which mark the transition from one dynasty to the next. But it is most explicit in the summary statement that concludes the Nippur recension.[38] According to this, eleven different cities shared the hegemony of lower Mesopotamia from the flood to the fall of Isin, each ruling from as little as one to as many as six times. In its own terms, then, the Sumerian King List is not so much a king list[39] as a *city* list.[40] The cities in question are variously described as capital cities (uru-sag, uru-ul, uru-kab-dug$_4$-ga),[41] royal cities (uru^{ki}-nam-lugal-la)[42], or cities of *illilūtu*[43], but in any case they, and not the individual kings nor their dynasties are the structural units of the Sumerian King List (SKL).

The same point of view informs the great King List A (KLA), which took up the chronographic theme where the Sumerian King List left off.[44] It began with the first Dynasty of Babylon, whose greatest king Hammurabi came to the throne, as it happened, in the year following immediately upon that in which Isin fell, and hence named for that event in the Larsa calendar,[45] and it continued with seven other dynasties, all identified by geographical names, more or less. These

32. Jacobsen, *The Sumerian King List*, AS 11 (1939), pp. 147-154.

33. For date lists spanning (parts of) two dynasties, see e.g., UET 1 292, from Ibbi-Sin 9 to Ishme-Dagan 6; cf. the latest reconstruction by Frayne, *Sumerian Royal Hymns*, p. 405.

34. E. Sollberger, "New Lists of the Kings of Ur and Isin" *JCS* 8 (1954) 135f.; cf. Grayson, "Königslisten und Chroniken. B. Akkadisch," *RlA* 6 (1980-83), p. 90.

35. YOS 1 32; cf. Grayson, *RlA* 6, pp. 89f.

36. King List B; cf. Grayson *RlA* 6, p. 100.

37. Sollberger, "The Rulers of Lagaš," *JCS* 21 (1967) 279-291.

38. Hallo, "Beginning and End of the Sumerian King List in the Nippur Recension," *JCS* 17 (1963) 52-57.

39. Least of all a "Sumerian" King List; cf. Kraus, *ZA* 50 45f.

40. Cf. G. Buccellati "The Enthronement of the King and the Capital City," *Studies in Honor of A.L. Oppenheim* (Chicago, 1964), p. 54, who does not use this description.

41. Hallo, "Antediluvian Cities," *JCS* 23 (1970) 60f; "Biblical abominations and Sumerian taboos," *JQR* 76 (1985) 26 n. 24.

42. Restore thus in P^2 with Edzard, "Königslisten und Chroniken. A. Sumerisch," *RlA* 6, p. 80 following Hallo, *JCS* 17 (1963) 56. For nam-lugal as incipit of the Nippur recension see *JCS* 17 (1963) 56f.; note, however, Civil's restoration of the corresponding lines in the Sumerian Flood story *apud* W.G. Lambert and A.R. Millard, *Atra-hasīs: the Babylonian Story of the Flood* (Oxford, 1969), p. 140 line 88.

43. uru-nam-^{d}En-líl-lá. I have not found any actual reference to the term.

44. For authoritative surveys of Babylonian and Assyrian king lists, see Grayson, "Assyrian and Babylonian king lists: collations and comments," AOAT 1, pp. 105-118; "Königslisten und Chroniken. B. Akkadisch," *RlA* 6, pp. 86-135.

45. Cf. already Hallo and Simpson, *The Ancient Near East*, p. 38 n. 19.

names variously represented the royal residence and/or seat of government (Babylon, E?), the general area of origin (Sealand II, Elam), ethnic affiliation (Kassites) or possible city of origin (Urukuga[46], Isin II [written PA.ŠE], Bazi). All alike follow the designation *bala* which in this context is usually translated "dynasty" but here as in the eponymous usage (above) should probably be rendered "turn."[47]

In the balance of King List A, the term *bala* is applied to a succession of alternating Assyrian and anti-Assyrian rulers not set off from each other by dividing lines and therefore lumped together in modern constructions as a "ninth" dynasty. The last, tenth or "Chaldean" dynasty is not preserved in this list, but can be easily reconstructed from other sources such as the Uruk King List (see below).

In contrast to this essentially geographical account of dynastic succession in lower Mesopotamia, the Assyrian scribes constructed one for upper Mesopotamia which was not only indifferent to the geographical origin, political focus or ethnic affiliation of its kings, but positively suppressed such data as far as they can be reconstructed from other sources. Given the eponymous system of dating in Assyria, one must assume the existence of eponym lists there, comparable to the date lists of Babylonia. But such eponym lists are known chiefly for the first millennium,[48] when they were sometimes expanded by the addition of short remarks characterizing the year in terms of its principal military activity or other affair of state, and thus rendering them functionally quite comparable to the Babylonian date lists. But the Assyrian King List (AKL) was not demonstrably based on such eponym lists,[49] nor did it adopt the structure of its Babylonian counterpart. Its sections, instead, feature a miscellany of subscripts which betray their composite origin. The first, subscribed "17 kings who lived in tents"[50] is now known to be closely related to the "Genealogy of the Hammurabi dynasty" (GHD); the second, subscribed "10 kings whose fathers (are known?)" may be regarded as a genealogy of the (non-Assyrian) king Shamshi-Adad I, and so on. From Bel-bani son of Adasi on, there are no more subscripts in any exemplars of the Assyrian King List and the dividing lines appear after each reign, thus eliminating any larger structural groupings; the emphasis is on the descent of all subsequent Assyrian monarchs from the obscure 17th century figure of Adasi. If any principle, then, underlies the grouping of kings in this source, it is that of family affiliation.

The same principle may be said to inform the GHD itself, though less explicitly. This document is not, in fact, a genealogy in the strict sense of the word. But because it lists the first nine rulers of the dynasty in succession and because each of these, except for the first, is known to have been the father of his successor, it is likely that the non-royal names which precede were thought of as ancestors of the First Dynasty of Babylon. In Finkelstein's interpretation of the text,

46. That is, Sealand I; see Lambert, "The Home of the First Sealand Dynasty," *JCS* 26 (1974) 208-210.

47. For the meaning of *palû* in Old Babylonian, compare e.g., Palāšu-līrik, "may his reign be long," as toponym (RG 3 s.v.) and as personal name (*Pa-lu-šu-li-ri-ik*; J. Rosen seal 01181, unpubl.).

48. One example, from Hattuša, goes back to the 14th century (KUB 4, 93), one from Assur probably to the 13th or 12th (*KAV* 1 21-24); cf. Benno Landsberger, "Assyrische Königsliste und dunkles Zeitalter," *JCS* 8 (1954) 110f. (1); M. Birot has recently published what amounts to an Old Assyrian "eponym canon"; cf. "Les chroniques 'Assyriennes' de Mari," M.A.R.I 4 (1985), p. 219-242.

49. See already Landsberger, *JCS* 8 (1954) 110f.; similarly W. Röllig, AOAT 1, pp. 275f.

50. Kraus, *Könige, die in Zelten wohnten* (Mededelingen der Koninklijke Nederlandse Akademie van Wetenschappen, afd. Letterkunde, Nieuwe Reeks—deel 28—No. 2); D.J. Wiseman, "They Lived in Tents," *La Sor AV* (Grand Rapids, 1978), pp. 195-200; Hallo, "Assyrian Historiography Revisited," *H.L. Ginsberg Volume* (*Eretz Israel* 14, [1978]), p. 5*.

it is a kind of libretto for a service of funerary offerings to these departed ancestors and this suggestion is persuasive, though it needs to be emphasized that the term *kispu* by which such a service is known is again not explicitly used in the text.

While the GHD thus shares a genealogical orientation with the AKL, it nevertheless also retains the geographical focus of the SKL-KLA tradition in its use of the *bala*, this time in connection with the Amorite people (*erín*), the Hanean people, Gutium and "the *bala* not recorded on this tablet" respectively.[51] Evidently the chronographic and historiographic traditions of Mesopotamia are complex. One cannot simply speak of two traditions, a northern one employing eponyms leading to king lists organized on strictly genealogical lines; and a southern one employing date-formulas (and, later, regnal years) and leading to king lists organized on strictly geographical or ethnic lines. Rather, we should perhaps regard the use of eponyms as at home in both north and (at least originally) south, and the preference for king lists organized on a "geographical" basis as a legacy of the Sumerian or core-tradition while the genealogical preference represented the Akkadian and more particularly the Amorite tradition which took firmest hold on the periphery of Mesopotamian culture.[52]

But there is more to this dichotomy than only an intellectual disagreement over the best approach to chronography. The documents so far considered were more than academic exercises. All were no doubt written, perhaps even commissioned, in order to serve specific purposes, and as far as can be seen these purposes were ideological. The patronage behind each of them was almost certainly royal, and the ideology espoused was presumably some sort of legitimacy. These comprehensive documents, surveying as they did a millennium or more of royal succession, must have served to undergird the legitimacy of the last entries on the list by asserting their continuity, in one way or another, with all those that preceded. The Sumerian tradition insisted that the succession passed from one city (or other geographical unit) to another; as we know from other sources divine decision ratified the transfer, most explicitly in the Lamentation over Sumer and Akkad 365-371;[53] note there again the use of the term *bala*. The "Akkado-Amorite" tradition insisted that it passed from father to son (or brother) even when this involved tampering with objective fact.[54] I have suggested elsewhere how these tendentious views served the purposes respectively of the Isin I dynasty (and thus make it the likeliest setting for the composition of SKL[55]) and of the Middle Assyrian kings of the 16th century.[56] Here it remains to consider the case of the KLA and GHD.

As noted before, the KLA took up matters where the SKL left off. But this is not to say that the KLA was initially conceived of as a successor document of SKL. In the first place, its origin cannot be traced back to the first dynasty of Babylon. And even if its inception should prove to date this early, that would make it rather a challenge and counter-tract to the SKL, not because it

51. For the meaning of these expressions, see variously Lambert, "Another Look at Hammurabi's Ancestors," *JCS* 22 (1968-69) 1f.; Röllig, AOAT 1, p. 273; R.R. Wilson, *Genealogy and History in the Biblical World*, YNER 7, pp. 111-113; Hallo, *Eretz Israel* 14 (1978) 4*f. A totally different interpretation was offered by A. Shaffer, according to whom bala = *manzaztu*, "turn of (civil of military) office" as in lú-bala = *bēl manzazti*, "office-holder," hence: "the workers/soldiers of the Amorites (etc.) who did military service . . . or fell in the line of duty." (Lecture of 5-9-79). Cf. also MSL 12, p. 170; 404-408.

52. For other aspects of this dichotomy, see for now Hallo, "Royal Titles from the Mesopotamian Periphery," *AnSt* 30 (1980) 189-195.

53. *ANET*[3], p. 617; cf. also Jacobsen, *Toward the Image of Tammuz* (= HSS 21 [1970]), p. 168.

54. For a late example, cf. Tiglatpileser III's being entered as the son of his predecessor; see Hallo and Simpson, *The Ancient Near East*, p. 132 and n. 18; Hallo, "From Qarqar to Carchemish: Assyria and Israel in the light of new discoveries," *BA* 23 (1960) 47 and n. 65.

55. Hallo, *JCS* 17 (1963) 55 and n. 41.

56. Hallo, *Eretz Israel* 14 (1978) 6*; cf. also Grayson, *RlA* 6, p. 102.

takes matters back to the beginning of the First Dynasty of Babylon, 112 years before the fall of Isin I with which the SKL ends, (I have never been one to believe that the SKL implied that the transfer of hegemony took place at the end of one dynasty and/or the beginning of the next[57]) but because it lacks any of the ideological formulations of SKL. What the two traditions share on the level of ideology is only the implicit notion that possession of the national cult center is the criterion for inclusion—but whereas in the Sumerian tradition this center is Nippur, in the new tradition it is Babylon. The challenge to the SKL is even more explicit in GHD which, late in the Babylon I period, abandoned the concept of the transfer of hegemony among successive geographical entities by legitimizing the simultaneous coexistence of four of them (shades of the "Four Quarters"?) (according to my understanding of the text) and then tracing the genealogical ancestry of the First Dynasty back to almost primordial times, quite in the manner of the polemical Rulers of Lagash (see above). Non-chronographic sources confirm the impression. Thus the switch from Enlil and Nippur to Enki (Marduk) and Eridu is a clear break with the essentials of Sumerian ideology even while continuing to employ its vocabulary.[58]

But when we turn to the next section of KLA, a very different picture emerges. The Sealand qualified for inclusion in KLA presumably by virtue of seizing Babylon in the wake of the Hittite raid that toppled the first dynasty. But not content with this displacement of its erstwhile rival in the seat of its kingship, the Sealand Dynasty also aspired to replace the First Dynasty in whatever claim it might have made to be the successor of the Isin dynasty and with it of the whole long succession of post-diluvian dynasties in the Sumerian tradition. It, or the historians of a later period, contrived to inflate the reigns of the first two sealand rulers Ilima-ilum and Itti-ili-nibi to an improbable total of 128 years (the individual figures are now largely lost according to the latest collations;[59] their sum is here reconstructed by deducting the preserved totals of the remaining nine kings [240] from the grand total for the dynasty [368]). In defiance of all we know of historical reality, according to which Ilima-ilum dates to the time of Samsuiluna and Abieshuh and Itti-ili-nibi to that of Abieshuh, the arithmetic of the KLA tends to make Ilima-ilum the contemporary of Hammurabi.[60] More specifically, it seems to date Ilima-ilum's accession to the time of Isin's fall, and by implication to make him and the Sealand (and not Babylon) into the successor to Isin I and its last ruler, Damiq-ilishu. Indeed, the next ruler of the Sealand assumed the same throne-name. Thereafter, as if to assert their links to the Sumerian tradition, the rulers of the Sealand assumed ever more ponderous and archaizing Sumerian names. Additional links are found, outside the chronographic literature, in Akkadian mythology of the end of the second millennium. The Erra epic hints at the survival of Sumerian learning in the extreme South of Babylonia after the fall of Babylon,[61] and the "Epic of Creation" has, according to Jacobsen, thinly disguised the struggle of Sealand (with Sumer) against Kassite Babylon as one of Tiamat (with Kingu) against Marduk.[62] And indeed to this day "Sumerian" traditions survive at the head

57. Hallo and Simpson, *The Ancient Near East*, p. 38.

58. J.J.A. van Dijk, "L'hymne à Marduk avec intercession pour le roi Abī'ešuh," *MIO* 12 (1966) 57-74; R. Borger, "Gott Marduk und Gott-König Šulgi als Propheten," *BiOr* 28 (1971) 22 and n. 4.

59. Grayson, *RlA* 6, pp. 91-93.

60. Cf. the chart in Hallo and Simpson, *The Ancient Near East*, p. 99, but note that the Sealand dates given there are only estimates.

61. Hallo, "Royal Hymns and Mesopotamian Unity," *JCS* 17 (1963) 116f. For a different view of "the assumed migration of the scribal tradition from Babylon to the Sealand" see J.D. Muhly, review of *Glass and Glassmaking*, by A.L. Oppenheim *et al.*, *JCS* 24 (1972) 179.

62. Jacobsen, "Religious Drama in Ancient Mesopotamia," in H. Goedicke and J.J.M. Roberts, eds., *Unity and Diversity*, Johns Hopkins Near Eastern Studies 7 (1975), p. 76; *The Treasures of Darkness: A History of Mesopotamian Religion* (New Haven and London, 1976), p. 189f. For the possible identification of Kingu with Sumer (Kengir) see Jacobsen, *Treasures*, p. 257 n. 337.

of the Persian Gulf in the reed architecture, the water-buffalo economy, and the high-prowed boats of the Marsh Arabs,[63] perhaps even in some of the peculiarities of their Arabic dialect.[64]

The legitimacy of the Kassites was, by contrast, not enhanced by such fictitious manipulations of KLA. But their successors, the Second Dynasty of Isin, may well have buttressed their claim to represent a reassertion of native Babylonian hegemony by once more putting forward a tenuous connection to Isin, which figures only in KLA as the name of their dynasty—and then only in a peculiar orthography (PA.ŠE, a playful orthography for *išinnu* = grain stalk). At best, this Isin was the original home of the dynasty; it certainly was not their capital, which was again Babylon. Similarly, the second Sealand Dynasty may have sought to strengthen its legitimacy by linking up to the First Sealand Dynasty.[65] (It should be noted however that its royal names were in part Kassite rather than Sumerian.)

We can thus characterize the historiography of second millennium Mesopotamia as converting simple lists of year-dates or eponyms into comprehensive overviews which pressed chronography into the service of ideology. In this process we have delineated two discrete structural principles or units of account—the geographical and the genealogical. The former is linked to the Sumerian or core tradition, the latter to the Akkadian/Amorite tradition associated, at least in part, with the Mesopotamian periphery. The triumphs of Rim-Sin of Larsa in the South, of Shamshi-Adad in the North, and of Hammurabi throughout Mesopotamia in the eighteenth century challenged the Sumerian concept of royal legitimacy and dynastic succession as enshrined in SKL, substituting for it the genealogical orientation of GHD and AKL; they challenged the traditional pre-eminence of the Sumerian religious capital at Nippur and the chief deity of the national pantheon, Enlil, substituting for it their old rivals Eridu and Enki or, more audaciously, Babylon and Marduk (respectively the city and deity called Assur). But the fall of Babylon early in the 16th century seemed to turn back this challenge and, it is here argued, the dynasty of the Sealand aspired to restore Sumerian traditions, probably inaugurating KLA (or at least the chronographic formulations on which it drew) in partial service to these aspirations. The Kassites in short order drove the Sealand from Babylon if not, at first, from Nippur. They were, for this or other reasons, disposed to regard themselves rather as successors to the First Dynasty of Babylon and their struggles against the Sealand as the triumph of Marduk over the older Sumerian pantheon. Their lengthy hegemony finally ceded to that of Isin II, whose kings apparently regarded themselves as restorers of native traditions linked to Isin I and all its postdiluvian predecessors.

The dichotomy thus outlined did not, however, survive into the first millennium. In effect, it became more and more difficult to maintain the fiction of a continuing Sumerian tradition centered on Nippur and the cult of Enlil when in fact the aura of religious leadership had for so long already attached to Babylon and the cult of Marduk. The dramatic recovery of the cult statue of the deity under the Second Dynasty of Isin, probably by Nebuchadnezar I, had inspired a whole corpus of new Akkadian religious literature, including perhaps the final formulation of the "Epic of Creation" and other celebrations of the exaltation of Marduk.[66] The ethnic

63. Cf. the works of W. Thesiger, G. Maxwell and others. See also R.M. Adams and H.J. Nissen, *The Uruk Countryside: The Natural Setting of Urban Societies* (Chicago, 1972), *passim* (cf. index s.v. Maᶜdān).

64. On which see Edzard, "Zum Vokabular der Maᶜdān-Araber im südlichen Iraq," *Festschrift für Wilhelm Eilers* (Wiesbaden, 1967), pp. 308-317.

65. W.G. Lambert, "The Home of the First Sealand Dynasty," *JCS* 26 (1974) 208-210.

66. Hallo and van Dijk, *The Exaltation of Inanna*, YNER 3, p. 66f.; Borger, *BiOr* 28 (1971) 22 adds the "Marduk-prophecy" to the dossier.

distinctions between Sumerians and Akkadians, Akkadians and Amorites, even Amorites and Kassites had long since blurred.[67] The stage was set for a reconciliation of the two chronographic and ideological traditions. In a mechanical way, this was accomplished, after a fashion, by the Assyrians in the Synchronistic History and the Synchronistic King Lists, documents which contrived to coordinate the histories, respectively the royal successions, of Babylonia and Assyria. In this task, they faced a problem not altogether unlike that of the Deuteronomist or Chronicler having to reconcile the histories of the Divided Monarchy.[68] But the clay tablet afforded them a medium and a solution not available to the Israelite historian: simply to employ the time-honored cuneiform technique of parallel columns in order to indicate graphically, if not very precisely, the synchronisms between the two ruling houses.

Another resolution was to take the age-old concept of the *bala*, or "turn of office," and combine it, neither with geographical nor with royal names, but with divine names. Already in the "Epic of Creation" (IV 29) Marduk received the *bala* (perhaps still in its original form and sense of a spindle) as one of the regalia, symbolizing his divine kingship, or perhaps that of his chosen dynasty on earth.[69] The omen literature refers to a *bala* of Enlil and especially that of Nergal, the latter as a code-word for and synonymous with all the worst fortunes of a time of troubles.[70] In the Chronicle of Early Kings, derived by late cuneiform historiography from the omen tradition, the *bala* of Ishtar served to designate the era of Sargon and the Sargonic kings of Akkad, and perhaps their predecessors at Kish as well; in Foster's new interpretation, it designated the epoch as a "dynasty of warfare."[71]

A rather more sophisticated resolution of the dichotomy was devised by the Babylonian historians in a text which has only gradually come to light in recent years, and which is still not completely recovered. Grayson edited the document in 1975 as no. 18 of his *Assyrian and Babylonian Chronicles*, appropriately enough under the title of the "Dynastic Chronicle," since it spanned successive dynasties and did so in the manner of the Chronicles.[72] But it differed from most other chronicles in the first place in the bilingual format of some of its exemplars; only the Weidner Chronicle (Chronicle 19) shared this feature. And additional fragments of the text published since Grayson's edition by Lambert in 1973 and 1974 and by Finkel in 1980[73] show that the Dynastic Chronicle was unique among chronicles in linking antediluvian and postdiluvian traditions, in this respect harking back to those recensions of the SKL which prefixed an antediluvian section or substituted a totally separate version of matters in the case of the Rulers of Lagash. By an ingenious welding of two traditions, the Dynastic Chronicle employed the transitional formula for the change of hegemony familiar from the SKL but reworded it by

67. Similarly Brinkman, "Babylonia under the Assyrian Empire. 745-627 B.C.," in M.T. Larsen, ed., *Power and Propaganda*, Mesopotamia 7 (1979), p. 225.

68. S. Talmon, "The Presentation of Synchroneity and Simultaneity in Biblical Narrative," *Scripta Hierosolymitana* 27 (1978) 9-26.

69. *CAD* Ḫ, p. 154: "they added to it scepter, crown [*sic*] and (royal) *bal*-symbol (at the installation of Marduk as king)." *ANET*, p. 66 renders: "they conferred on him scepter, throne and vestment (?)." Grayson, CRRAI 14, p. 72 n. 3: "They added to him (Marduk) the scepter, the throne, and rule."

70. Grayson, CRRAI 14, p. 72 and TCS 5, p. 46 n. 32; Jacobsen, HSS 21, p. 406f., n. 67.

71. Jacobsen, HSS 21, p. 406f., n. 67; Hallo and van Dijk YNER 3, p. 9f.; Grayson TCS 5, p. 152 no. 20 Al; Foster, "Notes on Women in Sargonic Society," in *La Femme dans le Proche-Orient Antique* (Paris, 1987), pp. 55f.: "IV. The dynasty of Ishtar."

72. The text was called "The Chronicle of the Babylonian Dynasties," by L.W. King. Grayson's term "Dynastic Chronicle" first appeared in print (to my knowledge) *apud* Brinkman, *A Political History of Post-Kassite Babylonia*, AnOr 43 (1968), p. 322(4).

73. Lambert, "A New Fragment from a List of Antediluvian Kings and Marduk's Chariot," *Symbolae Böhl*, (Leiden, 1973), pp. 271-280 and *JCS* 26 (1974) 208-210; I.L. Finkel, "Bilingual Chronicle Fragments," *JCS* 32 (1980) 65-80.

introducing the dynastic concept (*bala*) of KLA. What the Dynastic Chronicle asserted then, was the continuity of the antediluvian cities, the Sumerian traditions of Nippur, and the Akkadian/Amorite traditions of Babylon in one unbroken chain. Such assertions were anticipated in a non-chronographic text of the late second millennium which derived Nebuchadnezar I from the antediluvian king Enmenduranki of Sippar.[74] But the Dynastic Chronicle goes matters one better, so to speak, by linking the chronicle of dynastic succession to the very beginnings of history, to creation itself. And it does so, as in the story of the Flood and the antediluvians, by borrowing from Sumerian traditions; but this time it borrows not, as there, from the Nippur traditions but, in line with its Babylon bias, from those of Eridu. This has been shown convincingly in the most recent study of the text by Jacobsen who has pointed out fascinating parallels to the place of creation in Biblical historiography (and, we might add, in Berossos) and also provided suggestive restorations of the as yet missing portions of the document.[75]

At the beginning of the text, the new duplicates show that some fifteen lines were lost from the exemplar hitherto known and, given the disposition of lines on cuneiform tablets, allows us to argue that no more, and possibly fewer are still missing from the end of the text (i.e. the reverse of K.11261+; if there was an extensive blank space or colophon at the end of the text, it is possible that almost nothing is now missing from the end of the text proper). As far as preserved, the Dynastic Chronicle now takes matters down to the reign of Nabu-shum-ishkun. It is here proposed that it ended with him, i.e. in 748 or 747 B.C.E. What is the significance of this date in Mesopotamian historiography?

Here we must backtrack a moment. I have argued elsewhere that the first fixed point, turning-point, or starting point[76] in Mesopotamian historiography is the Flood—whether as a phenomenon in natural history or as a metaphor for an event in human history.[77] By modern calculations, it can be dated approximately 2900 B.C.E. In the native conception, the next watershed of comparable significance was the fall of Isin some 1100 years later, i.e. 1794 B.C.E. in the middle chronology (or 1730 by the low chronology). The entire interval is comprehended by the Nippur recension of SKL, and certain non-chronographic texts reinforce the importance attached to this event. So for instance the fall of Dunnum, a fortress guarding the approaches to Isin, in the prior year (1795 B.C.E. according to the date formula of Rim-Sin's 29th year) became the subject of a veritable theogony which began, like the Biblical Genesis, with "in the beginning" (*ina rêš*).[78]

Moving forward in time by another millennium (more or less) takes matters into the eighth century B.C.E. and sets the stage for what may have constituted a kind of millennarian outlook in Babylonia. Indeed, according to the theory of H. and J. Lewy, the Assyrian *dâru* consisted of fifty years, and seven *dârū* an epoch (350 years) worthy of mention in an inscription of Shamshi-Adad

74. Lambert, "The Seed of Kingship," CRRAI 18 (1974), pp. 427-440.

75. Jacobsen, "The Eridu Genesis," *JBL* 100 (1981) 513-529.

76. For this concept in Israelite history, see Hallo in C.D. Evans, W.W. Hallo, and J.B. White, eds., *Scripture in Context* (Pittsburg, 1980), pp. 9-11, 16-18.

77. Hallo and Simpson, *The Ancient Near East*, pp. 34-36. The metaphoric interpretation of the Flood has sparked considerable debate; see for now only J.S. Cooper, "Sumerian and Akkadian in Sumer and Akkad," *Or*NS 42 (1973) 245 n. 48.

78. Hallo, *JCS* 23 (1970) 66f. and nn. 112-114, 132-135. Latest translation by Grayson, *ANET*³, p. 517f. For the divine name Ḫaḫarnu (l.37) see also the incipit of the "Marduk-prophecy"; Borger, *BiOr* 28 (1971) 5:1 and commentary, p. 17. See the new edition by Jacobsen, "The Harab myth," SANE 2 (1984), pp. 97-120. For the *incipit* (*contra* Jacobsen) see van Dijk, *Bagh. Mitt.* Beiheft 2 (1980) n. 90 ll. 3f.

I[79]; three such epochs after 1793 would have run their course by 743. In fact, however, it was in 748 that the throne of Babylon changed hands and the accession of Nabonassar (Nabu-naṣir) took place. It was also in this year that, according to one theory, Piankhy rose to power in Egypt, founding a new capital at Napata and inaugurating the 25th dynasty and a new period of Egyptian self-assertion[80]; according to another theory, it was the year of the great earthquake in Israel recorded in Amos 1:1.[81] And already Kugler speculated that the spectacular conjuction of the moon and planets in 747 might have inspired it.[82] But whether it was any of these events and whether millennarian considerations played a part or not, certain it is that Nabonassar's accession was regarded by his successors as ushering in a new era in Babylonian history.

Whether it was so regarded also by himself and his contemporaries is another question. Brinkman[83] rejects the notion, and indeed one could find numerous parallels to ancient eras retroactively introduced many centuries after their starting point. The Christian Era, for example, dates from the early sixth century C.E. More particularly, the Olympic Era was introduced into Greek historiography only in the third century B.C.E., and the Roman Era ("*ab urbe condita*") even later.[84] Curiously, these two schemes begin, respectively, in 776 and 753 B.C.E., i.e. just before the accession of Nabonassar. Is there a possiblility that all three were the product of Hellenistic speculations?

In modern historiography, the conception of a "Nabonassar Era" was first put forward by F. X. Kugler in 1924[85] and then largely forgotten until taken up in a limited sense in 1960 in the context of my survey of first millennium contacts between Assyria and Israel[86] and reiterated in 1971.[87] It was given more formal expression by Brinkman in 1968[88] and by Grayson in 1975[89] and 1980,[90] and now needs to be considered in greater detail. I submit that there are no less than ten separate witnesses to the existence of a "Nabonassar Era" in later Mesopotamian historiography.

1) The most explicit of these is also the latest. According to Ptolemy, the Alexandrian astronomer of the 2nd century C.E., Nabonassar's reign inaugurated 424 years of Mesopotamian history which ended with the death of Alexander in 323 B.C.E. The "Ptolemaic Canon" that enshrined this concept[91] figured prominently in Ptolemy's writing because it helped his readers to employ the late Babylonian astronomical techniques which he described to them. Ptolemy's further contention "that practically complete lists of eclipses are available since the reign of Nabonassar"[92] seems borne out by such texts as *LBAT* 1413, "a report of lunar eclipses which could be dated about this time (718-746 B.C.)."[93] The tradition has thereby been regarded as strikingly confirmed ("schlagend bestätigt").[94]

79. H. Lewy and J. Lewy, "The Origin of the Week and the Oldest West Asiatic Calendar," *HUCA* 17 (1943) 72-75; differently *CAD s.v. dāru*.

80. K. A. Kitchen, *The Third Intermediate Period in Egypt* (1100-650 B.C.) (Warminster, 1973), p. 359.

81. J.A. Soggin,"Das Erdbeben von Amos 1:1," *ZATW* 82 (1970) 117-121. Cf. also Zechariah 14:4f.

82. Brinkman, AnOr 43, p. 227 n. 1434.

83. Brinkman, AnOr 43, pp. 226f. n. 1432.

84. Bickerman, *Chronology of the Ancient World* (Ithaca, 1978), pp. 70-77: "The Eras." Cf. above note 1 (end).

85. F.X. Kugler, *Sternkunde und Sterndienst in Babel II* (Münster, 1924), pp. 362-371: "Der Ursprung der Ära Nabonassar."

86. Hallo, *BA* 23 (1960) 51.

87. Hallo and Simpson, *The Ancient Near East*, pp. 144, 169.

88. Brinkman, AnOr 43, pp. 226f.

89. Grayson, TCS 5, pp. 13f.

90. Grayson, "Histories and Historians of the Ancient Near East: Assyria and Babylonia," *Or*NS 49 (1980) 174, 178, 193.

91. For a partial synopsis see S.M. Burstein, "The *Babyloniaca* of Berossus" SANE 1, p. 180; Grayson, *RlA* 6, p. 101; more complete in Bickerman, *Chronology of the Ancient World*, pp. 107-109.

92. Neugebauer, *The Exact Sciences in Antiquity* (New York, 1962), p. 98.

93. Brinkman, AnOr 43, p. 227 n. 1434.

94. Van der Waerden, *Erwachende Wissenschaft* 2: *Die Anfänge der Astronomie* (Groningen, 1966), p. 92. Note however, that this passage has been excised from the English translation, *Science Awakening* 2: *The Birth of Astronomy* (Leiden and New York, 1974), p. 91.

2) Almost equally explict is the testimony of another Hellenistic source, this time from Babylon itself, namely Berossos (wrote ca. 280 B.C.E.). Admittedly, it is virtually impossible to reconcile some of his dynasties with the known facts of Mesopotamian history or any of its chronographic traditions, and a recent attempt in this direction is not convincing.[95] But he is credited with the statement that "Nabonassar collected together and destroyed the records of the kings before him in order that the list of Chaldean Kings might begin with him."[96] Whether he really "destroyed" them may be questioned in light of the almost topos-like quality of the statement; more likely he simply summarized the prior traditions and contented himself with "destroying" the reputation of his immediate predecessor(s).[97] Moreover, Berossos either ended the second book of his *Babyloniaca* with Nabonassar[98] or, more likely, began the third and last with him.

3) Turning from the Greek sources to the native Mesopotamian ones, we may consider first the circumstantial but nonetheless suggestive evidence of the calendar. There is nothing to suggest that Nabonassar abandoned the practice of dating by regnal years in standard Babylonian usage for some 850 years by his time. But it seems highly likely that he reformed the calendar in another respect, namely by introducing a regularized intercalation based in part on calculation rather than only on observation. At one time, Winckler was prepared to credit Nabonassar with the introduction of an entirely new calendar.[99] At the same time, Eduard Mahler launched a series of articles specifically attributing to him the introduction of the nineteen-year cycle of intercalation[100] based wholly on calculation. This is unlikely, for even the relatively incomplete roster of intercalary months now known from Babylonian texts of the 8th - 6th centuries suggest that they were based partly on observation. Several letters promulgating intercalary months by royal or priestly edict and dating from the sixth century lead to the same conclusion.[101] But it is clear that these same centuries witnessed various experiments with calculations of the intercalation, such as "A scheme for intercalary months from Babylonia" identified by Hunger and Reiner in tablets from the 7th century,[102] and achieved ever closer approximations to the "standard cycle" which finally emerged at the beginning of the 5th century.[103] This standard cycle involved seven intercalations in nineteen years, six of them at the end of the twelfth month (second Addaru) and one at the end of the sixth (second Ululu). It is often referred to as the Metonic cycle, after Meton, the Greek astronomer immortalized in Aristophanes' *The Birds*, but his attempt to introduce the cycle in Athens in 432 B.C.E. was unsuccessful and was clearly derivative from the Babylonian invention.[104] Thus, although it was "only in Achaemenid times that a regular intercalation cycle of nineteen years was introduced,"[105] the roots of this cycle almost certainly go back to the eighth century and very possibly to the flurry of astronomical activity associated with Nabonassar.[106]

95. Burstein, SANE 1, pp. 175-177 (appendix 2).

96. Burstein, SANE 1, p. 164; Brinkman, AnOr 43, p. 227, cf. Mesopotamia 7, p. 242 n. 26.

97. Hallo, *JANES* 16-17 (1984-85) 149ff.

98. So Burstein, SANE 1, p. 164 and n. 66; p. 176 and n. 16.

99. *Geschichte Babyloniens und Assyriens* (Leipzig, 1892), pp. 121f., quoted by Grayson, TCS 5, p. 13 n. 40.

100. See the articles from 1892-1909 cited in B.Z. Wacholder and D.B. Weisberg, "Visibility of the New Moon in Cuneiform and Rabbinic Sources," *HUCA* 42 (1971) 227 n. 3 and 234.

101. Wacholder and Weisberg, *HUCA* 42 (1971) 230; R.A. Parker and W.H. Dubberstein, *Babylonian Chronology 626 B.C.—A.D. 75* (Providence, RI, 1956), pp. 1f.

102. H. Hunger and E. Reiner, "A Scheme for Intercalary Months from Babylonia," *WZKM* 67 (1975) 21-28; for another innovation dated c. 649 see D. Pingree and Reiner, "A Neo-Babylonian Report on Seasonal Hours," *AfO* 25 (1974-77) 7.

103. Wacholder and Weisberg, *HUCA* 42 (1971) 235 and 237; but begin in 498 rather than 481.

104. O. Neugebauer, *The Exact Sciences in Antiquity*, pp. 7, 140.

105. Hunger and Reiner, *WZKM* 67 (1975) p. 21.

106. Cf. already Hallo and Simpson, *The Ancient Near East*, p. 169.

4) To the Babylonians, however, the calendar was not the only, perhaps not even the chief outlet for astronomical calculations. From their point of view an equally "practical" use of them was in the service of divination. It is in this light that we may interpret yet another innovation, the introduction of the genre called "astronomical diaries," summarizing the astronomical observations for a period of half a year and associating them with observations on meteorological phenomena, the height of the Euphrates at Babylon, commodity prices and, occasionally, notable events in political, military or cultic history as far as they affected Babylon. I have been convinced for years of two things about these diaries; one that they represented a deliberate effort to assemble a "data base" on which to build a new astrological omen corpus, with astronomical or meteorological phenomena in the protasis and terrestrial events in the apodosis; and, second, that they began with Nabonassar. The date of the earliest diaries known to Sachs, who was editing them, has been gradually pushed further and further back, and though at present it is still in the middle of the seventh century (652 B.C.E.), the specialists of cuneiform astronomy now appear to agree to both the above propositions.[107] As it happened, the new omen series was never written—perhaps because the scribes were never satisfied that they had collected sufficient data. Indeed, diaries continued to be written till about 50 B.C.E.[108] and the almanacs derived from them until 75 C.E., well after cuneiform had ceased to be employed for any other purpose.[109] But the diaries occupied a central position among the so-called non-mathematical astronomical texts (including such derivatives as Goal-Year texts, Excerpts, Normal-Star Almanacs and Almanacs, all of which were gleaned from the diaries,[110] as were records of lunar eclipses going back to the 8th century),[111] and were in addition exploited for other purposes if not for omens.

5) In the first place, it can be argued that the commodity prices which are (from our point of view somewhat incongruously) recorded in the diaries provided the model for the "Chronicle of Market Prices."[112] To quote Grayson, "There is a very close affinity in phraseology between the Chronicle's entries and those which concern prices in astronomical diaries and, since this text seems to end about 748 B.C.E. and the astronomical diaries begin the following year, one might speculate that this chronicle was composed as a kind of prologue to the commerical quotations in the astronomical diaries."[113]

6) But there was a far more significant "spin-off" from the Astronomical Diaries. Specifically, it is here proposed that the diaries, and more particularly the notable political, military or cultic events occasionally appended to them, were collected together to create a truly revolutionary innovation in Babylonian historiography: the Babylonian Chronicle.[114] This began precisely with the accession of Nabonassar[115] and continued in the style adopted for Chronicle 1 (747-648 B.C.E.) into Selucid times.[116] The genre as far as preserved is a remarkable departure from all previous

107. See A. Sachs, "Babylonian Observational Astronomy," *Philosophical Transactions of the Royal Society of London*, Series A (1974), pp. 44 and 47 (fig. 2.) for the second.

108. Sachs, *Philosophical Transactions of the Royal Society of London*, Series A, p. 48.

109. Sachs, "The Latest Datable Cuneiform Tablets," *Kramer Anniversary Volume*, AOAT 25 (1976), pp. 379-398 and pls. XV-XIX.

110. Aaboe, "Observation and Theory in Babylonian Astronomy," *Centaurus* 24 (1980) 15.

111. Sachs, *Philosophical Transactions of the Royal Society of London*, Series A, p. 44.

112. Grayson, TCS 5, Chronicle 23.

113. Grayson, *RlA* 6, pp. 88f.

114. Cf. already Lambert, "Nabonidus in Arabia," *Proceedings of the Fifth Seminar for Arabian Studies* (1972), p. 53. Similarly Grayson, TCS 5, p. 13 and n. 42; J. van Seters, "Histories and Historians of the Ancient Near East: Israel," *Or*NS 50 (1981) 176.

115. Grayson, TCS 5, Chronicle 1.

116. Grayson, TCS 5, Chronicles 2-13a.

Babylonian historiography. Although Chronicle texts may have been put together earlier in the first millennium (notably Chronicle 17), these were in most cases little more than compilations of historical omens excerpted from extispicy series (Chronicle 20) or blatantly propagandistic tracts (Chronicles 19 and 21; for Chronicle 18 see above; for Chronicle 23 see above; for Middle Assyrian Chronicle fragments see TSC 5, pp. 184-9). The Babylonian Chronicle, however, eschewed the fanciful or traditional character of many of the so-called historical omens[117] and provided instead an unusually objective account of events. It reported Babylonian defeats as dispassionately as Assyrian or other triumphs. Its bias was clearly religious or cultic, not political, and it is therefore a reliable guide to political history.

7) A parallel of sorts to the Babylonian Chronicle is furnished by an equally unique if considerably briefer document of prophetic or apocalyptic character. The fragmentary text published by Grayson as the Dynastic Prophecy is broken at its beginning, so it cannot be asserted with total confidence that it too began with Nabonassar, but like the Babylonian Chronicle it pursued matters into Seleucid times, comprehending all the intervening dynasties.

8) The same can be said of the Uruk King List.[118] Although its first editor, van Dijk, doubted that it could have begun as early as Nabonassar, the photograph published by Grayson[119] does not seem to rule this out. Certainly it continued matters well into the Seleucid period, without however, the use of dividing lines or any other structural indications to set off successive dynasties.

9-10) Other innovations can so far be attributed to Nabonassar only on somewhat more tenuous grounds. Among them are the so-called 18-year cycle texts[120] and the introduction of the zodiac.[121] However, Neugebauer[122] takes the same diary texts to prove on the contrary that in 419 B.C.E. the zodiacal signs had not yet been introduced, but instead, constellations ("ecliptical constellations") were still used as reference points.

The numerous innovations thus associated with Nabonassar stand in sharp contrast to the actual circumstances of his reign. Whatever high hopes he may have harbored at its outset, they were very soon dashed on the rocks of hard political reality. We have no royal inscriptions of the fourteen-year reign, and two private inscriptions of the time may be regarded as evidence of the relative strength of private dignitaries and corresponding weakness of the monarchy.[123] Only three years after Nabonassar's accession in Babylonia there occurred that of Tiglatpileser III in Assyria. Here was a truly heroic figure, destined to lay the foundations of the neo-Assyrian empire. He too tampered with traditional historiographic conventions, reviving the age-old concept of the *bala* (in its Akkadian guise of *palû*) to date and count his annual campaigns, but beginning these with his accession year instead of waiting, like his predecessors, for the first full year of his reign.[124] At some point in his reign, he came to Nabonassar's aid, extricating him from

117. On which cf. Reiner, "New Light on Some Historical Omens," *AnSt* 24 (1974) 257-261; I. Starr, "Notes on Some Published and Unpublished Historical Omens," *JCS* 8 (1977) 157-166; Cooper, "Apodotic Death and the Historicity of 'Historical' Omens," CRRAI 26, Mesopotamia 8 (1980), pp. 99-105. Note the vindication of some of the historical omens in Hallo, "Simurrum and the Hurrian frontier," CRRAI 24 (*RHA* 36 [1978/1980]), pp. 74-76.

118. Grayson, *RlA* 6, pp. 97f.; Borger, "Zur Königsliste aus Uruk," *AfO* 25 (1974-7) 165f.

119. Grayson, "Assyrian and Babylonian Kings Lists: collations and comments," AOAT 1, pl. III (top).

120. Brinkman, AnOr 43, p. 227 n. 1434.

121. B.L. van der Waerden, "History of the Zodiac," *AfO* 16 (1952-3) 216-230, cf. 220.

122. Neugebauer, *The Exact Sciences in Antiquity*, p. 140.

123. Brinkman, "The Akītu Inscription of Bēl-ibni and Nabû-zēra-ušabši," *WO* 5 (1969) 39-50.

124. Hallo and Simpson, *The Ancient Near East*, p. 132f.; cf. H. Tadmor, "The Campaigns of Sargon II of Assur," *JCS* 12 (1958) 12 n. 75.

the unrelenting pressure of Chaldeans and especially Arameans.[125] According to a thesis first put forward by Anspacher in 1912,[126] Tiglatpileser may have been responding to a call for help from Nabonassar, much as he did for Ahaz of Judah in the Syro-Ephramite war,[127] but this parallel, though accepted by Brinkman[128] and myself[129] has never been demonstrated. In any case it is clear that Babylonia paid dearly for the Assyrian help, whether solicited or not, for Assyria was now permanently and intimately involved in the affairs of its southern neighbor and, within five years of Nabonassar's death, Tiglatpileser ascended the throne of Babylon in his own person. The Assyrian king assumed a special Babylonian throne-name, perhaps out of deference for the ancient prerogatives of Babylon which Assyrian kings had always respected since the ill-fated precedent of Tukulti-Ninurta I. And he refrained from imposing the Assyrian system of eponymous year-dates in Babylonia, to judge by the regnal-year system employed in Babylonian tablets from his reign.[130] But at the same time he could hardly have looked with favor on the perpetuation of a system of dating by an era that began with Nabonassar, even if that practice had been followed by Nabonassar's immediate successor—a fact which, absent any dated tablets from that reign,[131] or of texts bearing a date higher than Nabonassar 14,[132] we can only surmise. Note however that Nabonassar was at least succeeded by his son (albeit for only two years)—the only "recorded instance of accession by inheritance between 815 and 606 B.C.E." in Babylonia, as noted by Brinkman.[133]

Thus the Nabonassar Era is conspicuously lacking in the one factor which would have turned it into a true era in the modern sense: the abandonment of the regnal year system in favor of a continuous dating system extending beyond the boundaries, first of individual reigns and then of individual dynasties. It was left for the Seleucid (and Arsacid) Eras to introduce the first of these dating reforms to the Asiatic Near East, and for the religious eras—Christian, Jewish, Moslem—to breach political and dynastic boundaries and produce the second.

125. Borger and Tadmor, "Zwei Beiträge zur alttestamentlichen Wissenschaft aufgrund der Inschriften Tiglatpilesers III," *ZATW* 94 (1982) 244-251, esp. 247.

126. A.S. Anspacher, *Tiglath Pileser III*, Contributions to Oriental History and Philology 5, p. 19.

127. M. Cogan and Tadmor, "Ahaz and Tiglath-Pileser in the Book of Kings: historiographic considerations," *Eretz-Israel* 14 (1978) 55-61, English summary p. 124*.

128. Brinkman, AnOr 43, pp. 229 n. 1443.

129. Hallo and Simpson, *The Ancient Near East*, pp. 144f.; cf. Hallo, "Nebukadnezar Comes to Jerusalem" in J.V. Plaut, ed., *Through the Sound of Many Voices* (Toronto, 1982), p. 56 n. 7.

130. TCL 12 1-3; note, however that his Assyrian name is used in the dates of these tablets. Cf. now also E. Leichty, "A Legal Text from the Reign of Tiglath-Pileser III," *Erica Reiner AV* (AOS 67 [1987]), pp. 227-29.

131. Brinkman, AnOr 43, pp. 234f.; Brinkman and D.A. Kennedy, "Documentary Evidence . . . ," *JCS* 35 (1983) 65.

132. Brinkman, AnOr 43, pp. 233; Brinkman and Kennedy, *JCS* 35 (1983) 63f.

133. Brinkman, Mesopotamia 7, p. 128 and n. 33.

A Scene in the Realm of the Dead

HARRY A. HOFFNER JR.

The Ankara fragment Bo 69/946 (published as KBo 22.178) and the Berlin fragment Bo 3329 (published as KUB 48.109) are respectively the left and right sides of columns ii and iii of the same tablet. The join is indirect, but is confirmed by the physical evidence of conformity of the size of the fragments, identical script, and the disposition of the text over the lines. Although we have no information as to the find spot of Bo 3329, Bo 69/946 was recovered from the "Fallschutt" east of magazines 7-9 of the Big Temple in the Lower City (K/19 on the grid of Hattuša).[1] The fragments are written in a small, elegant hand of the New Hittite period.

The join identification, which I made in 1984 in the course of preparing the article on the word *mirmirra-* (cf. *mirmirruš* in iii 7) for the *Chicago Hittite Dictionary* (see vol. 3, p. 295), allows us to understand what is being described in the context and to have some idea of what kind of text this might be.[2] Given the extremely limited context we cannot unfortunately determine if we are dealing with a Hittite translation of some foreign literary work.[3] For this reason we cannot claim that the ideas and concepts expressed are truly Hittite.

Transliteration

col. ii

2′ x [*na-an* ḪU]L-*lu-u*[*š*][4]
3′ *te-e-na-u*[*-wa-aš ḫar-zi nu-uš Ú-U*]*L ka-né-e*[*-eš-zi*]
4′ *a-ra-aš a-r*[*a-an Ú-UL ka-né-e-*]*eš-zi*
5′ *an-na-né-ke-*⌜*e*⌝[*-eš*[5] *Ú-UL ka-né-e-*]*eš-ša-an-zi*

1. H. Otten and Chr. Rüster, Keilschrifttexte aus Boghazköi 22.x.

2. I should like to acknowledge here my indebtedness to Prof. Güterbock, with whom I had the privilege of discussing this fragment from the moment that I had identified the join.

3. Unless this fragment belongs, as I very tentatively suggest below, to the same composition as KUB 43.60.

4. The trace in KUB 48 looks even more like *-u*[*n*]. If it is, line 3′ would have to be read: *te-e-na-u*[*-wa-an . . .*]. But then I would have no suggestion as to restoring the clause.

6′ *pa-ap-pa*(-!) ŠE[Š.MEŠ[6] *Ú-UL ka-n]é-e-eš-ša-an-zi*
7′ *an-na-aš-za* DUMU-*a[n-ši-in Ú-UL k]a-né-e-eš-zi*
8′ [DUMU-*aš-za* A]MA-*a[n-ši-in Ú-UL k]a-né-e-eš-zi*
9′ [ ] x [*Ú-UL ka-]né-e-eš-zi*
10′ [ ]LÚ?[*Ú-UL] ka-né-e-eš[-zi]*

col. iii

1 *[ša-ni-i]z-zi-ia-a[z-ká]n* ^{giš}BANŠUR-*az*
2 *[Ú-U]L a-da-an-zi [ša-n]i-iz-zi-ia-az-kán ḫa-ap-š[a-al-li-az]*
3 *[Ú-U]L a-da-an-zi [ša-n]i-iz-zi-ia-az-kán* GAL-*az*
4 *Ú-UL a-ku-wa-an-zi [a-aš-š]u a-da-tar Ú-UL a-da-an-z[i]*
5 *a-aš-šu a-ku-wa-tar-mi[-it Ú-U]L a-ku-wa-an-zi*
6 *šal-ú-i-nu-uš az-[zi-kán]-zi*
7 *mi-ir-mi-ir-ru-uš [ak-ku-uš-k]án-zi*

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8 *ú-e-et-ri-iš*[(-)]x
9 *še-er-ša-ma[-aš*[?]]x x[ ]
10 *nu ad-d[a-aš*]
11 *ḫa-az*[-]
(Column breaks off here)

col. iv

1′ [ ]x
2′ [ ]
3′ [*-i]a-tar*[7] *e-ku*
4′ [ ] *le-e*
(Tablet breaks off here)

Translation

"(ii 2) [. . . The ev]il (3) *tenawa-* [holds (?) him (?) (or: [he . . . s the evi]l (accus.) *tenawa-*), so that] he does not recognize [them]. (4) One doesn't recognize the other. (5) Sisters by the same mother do [not re]cognize each other. "(6) Brothers by the same father do [not re]cognize each other." (7) A mother does [not] recognize [her] own child. (8) [A child] does [not] recognize [its own] mother. (9) [. . .] does [not] recognize [. . .]. (10) [. . .] does [not] recognize [. . .]. (iii 1) From a fi[ne] table (2) they do [no]t eat. From a [fi]ne stool (3) they do [n]ot eat. From a [f]ine cup (4) they do not drink. They do not eat [goo]d food. (5) They do not drink my good drink. (6) They eat bits of mud. (7) They [dri]nk muddy waters (?). (New paragraph.) (8) Emaciation (?) [. . .] (9) Upon the[m . . .] (10) And the fat[her . . .] (11) dri[ed up (?) . . .] (blank line) . . . (2′) . . . (3′) . . . Drink [. . .] water! (4′) [Do] not [. . .]!"

5. *an-na-né-ki-u*[*š* is impossible, because both *nega-*and *annanega-* are a-stem nouns requiring an acc. pl. *annanekuš* (see laws 191 and 194).

6. Or Š[EŠ-*eš*].

7. Or [*w*]*a*[?]*-a-tar* or [ ]x A-*tar*.

Since a portion of the middle of the tablet is missing, we must find a basis to determine the original width of the column. The proposed restorations in column iii are fairly certain. Using them as a basis, we can determine the distance between the inscribed surfaces of column ii on the other side. That distance allows for the restorations which I have proposed. Since columns ii and iii are consecutive, the textual material at the end of ii continues immediately with the beginning of iii. This gives us a larger context than would have been the case had the text of the two sides been discontinuous (that is, belonging to columns i and iv).

The preserved text describes typical members of human society. They are depicted in a sad state in which even members of the same nuclear family (parents and children, the closest of siblings) do not recognize one another and no one eats or drinks well. In some respects this situation reminds one of the descriptions of the land in vanishing god myths after the deity has departed.[8] But even closer links can be drawn to Mesopotamian texts describing the condition of the dead. According to these sources,[9] the dead eat clay (*ṭidda*) and drink muddied water (*mê dalḫūti*).

As stated above, we cannot tell if KBo 22.178+KUB 48.109 is a translation of a foreign work. If we could prove it to be a Hittite composition, we could draw some interesting conclusions about Hittite conceptions of death and the afterlife, about which we already know a great deal from other native Hittite sources.[10] The funeral ritual for Hittite royalty, edited by Otten in 1958,[11] shows that the Hittite king might look forward in the afterlife to plowing on his own land.[12] Nothing in Hittite sources suggests that the existence of the deceased after death was a sad or deprived one. The king's death itself was a tragedy (it is called *šalliš waštaiš* "a/the great sin"),[13] not because the king was going on to an unhappy existence, but because the death of the monarch created a disturbance of the divinely willed order.[14] Obviously, survivors mourned the departed because of their own loneliness and sense of loss. But whether they also mourned because the existence of their loved ones after death was a miserable one cannot be determined from the information we have.

The interesting word *tenawa-*[15] occurs elsewhere in published texts only in KUB 43.60 i 32-37 (a mythological text): *a-ru-*[<*na-*>*š*]*a-an pa-i-mi* (33) [*d*]*a*[?]*-a-ša-na-ša!-an* (or: [*t*]*ák!!-ša-na-ša!-an*, cf. i 7) *pa-i-mi* ID-*p*[*a mu*]*-u-uḫ-ḫi lu-li*[*-ia*] (34) *mu-uḫ-ḫi te-na-wa-ša-an pa-i-m*[*i o*] *x pa-i*[*-mi*] (35) *te-e-na-wa-aš i-da-a-lu-uš* x x[. . .] (36) *ú-el-lu-wa li*[- . . .] (37) *ši-ú-ni-ia*[-. . .] "I will go to the sea (?);[16] I will go to the plain (?); I will fall into the river; I will fall into the pond; I will go to the *tenawa-*; I will go to the [. . .]. The *tenawa-* (is?) evil[17] [. . .] to the meadow [. . .]." Here

8. Cf. H.H. Laroche, Textes mythologiques hittites en transcription (Paris, 1965, 1968), pp. 30, 39, 52f., 60, etc.

9. Cf. Schmökel, *Kulturgesch.*, pp. 455, 493, and "Descent of Ishtar to the Nether World" lines 7-11 (English translation in J.B. Pritchard, ed., *Ancient Near Eastern Texts Relating to the Old Testament* [3rd ed., Princeton, 1969], p. 107a): "to the house wherein the entrants are bereft of light, where dust (SAḪAR.ḪI.A) is their fare, and clay (*ṭid*[*du*]) their food, where they see no light, residing in darkness, . . . ," and lines 32-33 (*ANET*, p. 107b): "Should I drink water with the Anunnaki? Should I eat clay (*ṭidda*) for bread, drink muddied water (*mê dalḫūti*) for beer?" Compare also *AnSt* 5 (1955) 98:27 (Cuthean legend) and *CAD* Š sub *šatû* 1 a 1′ (seen in proofs, courtesy of E. Reiner).

10. See the judicious treatment of the subject by H. Otten in *Hethitische Totenrituale, VIO* 37 (Berlin, 1958), hereafter cited as *Totenrituale*. The article "Unterwelt" by D. Wachsmuth in *Der kleine Pauly* 5 (1964-75), 1053-56, which offers very speculative ideas about the Hittite conception of the afterlife (often based on nothing but doubtful etymologies), is of little value.

11. Otten, *Totenrituale*.

12. Otten, *Totenrituale*, pp. 12-17, 48, 78ff.

13. Otten, *Totenrituale*, p. 118f.

14. So Otten, *Totenrituale*, p. 119.

15. Probably unrelated to the verb *tinnu-* "to paralyze," to the epithet ^{d}U *tinniša* (KBo 22.116 obv. 4), or to *alwanzatar tin*[?]*-ni-ša-an kuit ḫalziyan*[. . .] (KUB 24.13 ii 4), which Haas and Thiel render "paralysis" in AOAT 31, pp. 104f., 359.

16. Or, in pairing with *takša*(*n*)*na* ("to the plain,") could this word be derived from *aru-* "high, steep" (used of mountains), ("to the high/steep place"?).

17. Or: "the evil *tenawa-*"; or: "the evil [. . .] of the *tenawa-*."

we see the *tenawa-* as a location, perhaps a natural one like a plain, a river, a pond, or a meadow. In KUB 43.60 i 35 the *tenawaš* is described as "evil" (*idalu-*),[18] just as in KBo 22.178 + KUB 48.109 ii 2′ -3′. In KUB 43.60 i 32-34 the verb *pai-* "to go" takes its destination in the a-case (allative) together with *-šan*. The verb *mau(š)-* (*muḫḫi*) "to fall" takes its destination in the a-case with no local particle. The context preceding and following KUB 43.60 i 32-37 is difficult to understand. The "traveler" and his "road" are mentioned in i 30. And, whether the "road" is understood literally or metaphorically, lines 32ff. may describe the locations to be visited or hazards anticipated on the journey.[19] If the "great road" of the "human soul" mentioned in KUB 43.60 i 28-29 is the road it travels after death, the evil *tenawa-* as a location on that road would recall the river of death (Styx). In KBo 22.178 + KUB 48.109 ii 2′f. the mention of the "evil *tenawa-*" immediately before the section describing the inability of close relatives to recognize one another might suggest it was either a phenomenon which restricted vision (such as a dense thicket or undergrowth, or mist, fog, or cloud) or that it was a magical "river of forgetfulness" like the river Lethe of the Orphic conception.[20]

The verb *kanešš-*, which lacks *-za* in most of the repetitions (ii 4′-6′, impossible to tell in ii 8′-10′), has it only with the mother recognizing her own child (ii 7′). I have also restored it in the following line, where the child recognizes his own mother.

In lines ii 5-6 it is not clear to me if the sentences require a direct object. If an object is required, restore perhaps: *annaneke[š=an UL kan]ešš̆anzi pappa*(-!)ŠE[Š.MEŠ=*an UL kan*]*ešš̆anzi* "(His/Her) sisters by the same mother do not recognize him/her; (his/her) brothers by the same father do not recognize him/her." But since in the other sentences no "him" (anonymous object, the deceased) seems to be expressed, I prefer to leave ii 5-6 without a restored object and to translate "Sisters by the same mother do not recognize (each other); brothers by the same father do not recognize (each other)."

Lines ii 5-6 give us a new departure in our interpretation of Hittite sibling terminology. In 1949 Goetze proposed with some hesitation that the word *annanekuš* (pl. acc.) in laws 191 and 194 was a composite of *anna-* "mother" and *nega-* "sister."[21] His colleagues were sceptical. Friedrich considered the idea very improbable, and continued to translate *annanekuš* as "prostitutes" and to regard *nega-* as a word of unknown meaning.[22] In her 1964 edition of the Hittite laws Imparati[23] presented Goetze's and Friedrich's views and did not attempt to decide between them. She noted, as did I two years later,[24] that in any case the phrase "and their mother" shows that the two women were in fact sisters, whether or not the word *annanega-* meant what Goetze thought. I preferred to interpret *annanega-* as "sister" and to consider *nega-* as unrelated. Also in 1966 Kronasser[25] rejected Friedrich's translation "Dirne" and considered *annanega-* as "eine weibliche Verwandte ('Halbschwester' oder ähnliches ?)." Armed with a crucial new occurrence of *nega-* in the newly discovered KBo 22.2 (Zalpa text) and another occurrence of *annanega-* in KBo 21.35 i 11, Otten returned to the subject in 1971 and 1973.[26] His conclusion was that *nega-* was a general term for a young female blood relative (girl, sister, daughter, etc.) and that *annanega-* was a more

18. Or as having an evil associated with it.

19. The sentences translated above as statements may of course also be construed as questions ("Will I go? Will I fall?").

20. Cf. Jane Harrison, *Prolegomena to the Study of Greek Religion* (3rd ed., New York, 1955), pp. 574-83.

21. Goetze, *ArOr* 17.1/2 (1949) 289ff.

22. J. Friedrich, *Hethitisches Wörterbuch* (Heidelberg, 1952-1954), pp. 21, 150. Friedrich, *Die hethitischen Gesetze* (Leiden, 1959), p. 114 with n. 5.

23. F. Imparati, *Le leggi ittite* (Rome, 1964), p. 316.

24. H. A. Hoffner, *Or*NS 35 (1966) 391f.

25. H. Kronasser, *Etymologie der hethitischen Sprache II* (Wiesbaden, 1966), p. 126.

26. H. Otten, *ZA* 61 (1971) 240, and StBoT 17, pp. 6f., 36.

precise designation of this relationship. In 1974 Eichner[27] correctly identified the components "mother" and "sister", but instead of translating "sister having the same mother" used "sister of the mother" to arrive at "aunt." Kammenhuber in 1975[28] adopted a modification of Otten's view, interpreting *nega-* as "sister" or "daughter" but tentatively giving some credence to Goetze's view by translating *annanega-* as "Schwester (von derselben Mutter?)." Nine years later, in 1984, Puhvel[29] accepted Goetze's view fully. He applied the translation "sisters of the same mother" both to the laws and to KBo 21.35 i 11, but seemed strangely ignorant of KBo 22.178 ii 4, which he did not even mention. Puhvel implied[30] incorrectly that Kronasser, Imparati, and Otten[31] had expressed agreement with Goetze's view. Our review of the evidence here shows that no one prior to Puhvel was willing to agree with Goetze completely. Imparati did not exclude Friedrich's translation "Dirne" so long as one understood that the two women were also sisters. Kronasser and Otten thought the word denoted a young female relative, either daughter or sister. The crucial evidence of KBo 22.2, showing that *nega-* did denote a young female relative, probably sister, only became available in StBoT 17 (1973), after the studies by Goetze, Friedrich, Imparati, Kronasser, and Hoffner. After that date it was easier to see the correctness of Goetze's view on *annanega-*, although even then Kammenhuber used a question mark for "(von derselben Mutter?)." Otten too was cautious in this respect.

KBo 22.178+KUB 48.109 now furnishes conclusive evidence proving Goetze right. *annaneke[š]* and *pappa* (-!) ŠE[Š.MEŠ][32] are clearly a pair, both nom. pl. *anna-* "mother" and *pappa-* "father" correspond in the two words, as do *nega-* "sister" and ŠE[Š] "brother." It is impossible to interpret *nega-*(in *annanekeš*) as "daughter"[33] or "female cousin," because in this text the male counterpart is ŠEŠ "brother," not DUMU "son" or ^{LÚ}*anniniyami-* "male cousin." Since the relationship would need to be a very close one to fit this context, only "sisters" and "brothers" are appropriate. Collation confirms that the copy of KBo 22.178 is correct in showing word space on the tablet between *pa-ap-pa* and ŠE[Š . . .]. Yet the parallelism of *annanekeš* and *pappa* ŠE[Š . . .] forces us to the conclusion that *pappa*(-) ŠEŠ—whether it is graphically one word or two—was a compound noun meaning "paternal brother." The word *pappa-* "father" is also known from Palaic.[34] Like modern "papa" this word is clearly of the Lallwort type, typically mouthed by babies.

As for the syllabic Hittite equivalent of *pappa* (-) ŠE[Š-*eš*], we may propose that this term is identical with a word which twice occurs syllabically in published texts: *pappanekna-*. In KUB 29.1 iii 45ff., 49ff. we read:

> *nu=zan* DUMU.SAL.MEŠ É-*TIM ešantari* . . . *nu=zan pa-ap-pa-ni-ik-né-eš ešantari*
>
> "The daughters of the (royal) household take their seats . . . the brothers by the same father (that is, sons of the king) take their seats."

Schwartz in *Or*NS 16:44 suggested that *pappanikneš* corresponded to DUMU.NITA.MEŠ "sons" ibid. v 2. But in this context "brothers by the same (royal) father" immediately following "daughters of the (royal) household" is a clear enough indication of who is meant. Since the king

27. *Die Sprache* 20 (1974) 185.

28. J. Friedrich and A. Kammenhuber, *Hethitisches Wörterbuch* 1 (2nd ed., Heidelberg, 1975ff.), p. 76 (separate publication of the first fascicle was in 1975; the finished vol. 1 has the dates 1975-1984).

29. J. Puhvel, *Hittite Etymological Dictionary* 1 (Berlin /New York, 1984), pp. 58ff.

30. *HED* 1, pp. 58f. "correctly interpreted by Goetze . . ." immediately followed by "cf. Kronasser . . ." with no indication that the authors cited thereafter (other than Hoffner) took a view different from Goetze's.

31. In StBoT 17 36.

32. Or *pappa*(-!)ŠE[Š-*eš*]?

33. Otten and Kammenhuber allow "daughter" as a possible translation of *nega-*, although neither has claimed it for the *nega-* in *annanega-*.

34. Carruba, StBoT 10 66.

had children by different women, it was proper to express the relationship of the princes this way.

A second passage containing *pappanekna-* is VBoT 58 i 36-37:

nu=wa ^{d}*Ḫašamilias* ŠEŠ.MEŠ-ŠU [*pa-ap-pa-a*]*n-ni-ik-ni-eš nu=wa apūš*
Ḫaḫḫimaš UL IṢBAT

"Hašamili's brothers were (Hahhimas') brothers by the same father. (Therefore) Hahhimas did not seize them."

The above statement offers a precision of ŠEŠ.MEŠ "brothers (in general)" by *pappanneknes*. Here one might consider the possibility that ŠEŠ in itself implied a full brother, one having the same mother and father, while the addition of *pappa-* could either (1) imply a half-brother, sharing only the same father, or (2) continue to imply full brother, but reinforce the necessity of having the same father. The same possibilities exist for *nega-*(= NIN) "sister" and *annanega-* "sister having the same mother." The occurrence of the latter in the laws shows that the *ḫurkel* "incest" applies only when the women have the same mother, whether or not they also have the same father. In any event Schwartz' translation "sons" would not fit in this second passage. And other translations such as "minor (?)," "non-adult (?)," although they face no objection here, have nothing positive to commend them over the translation suggested here.

If the above equation *pappa-*ŠEŠ = *pappanekna-* is correct, one would expect a word *nekna-* "brother" to occur. Now it happens that there is such a word in the ritual fragment KBo 20.31:[35]

obv.

4 *ma-a-an* ÌR-*KA wa-aš-ta-i na-a*[*n*(-)
5 *ku-e-ši-ma-an-kán le-e an-da-ma* x[
6 Ù A-*ḪI-KA ne-ek-na ḫal-zi-iš-ša*[-*i*?
7 DUMU.MEŠ LUGAL *ṢI-IḪ-ḪI-RU-TIM A-NA PA-NI* LUGAL [
8 *nu* LUGAL-*uš ku-e-da-ni-ia ut-ni-a*[*n-ti . . . pa-iz-zi nu a-pé-e-ia* (?)]
9 *pa-iš-kán-ta-ru . . .*

"If your[36] servant[37] 'sins,' [remove (?)] him, but do not kill him. But [. . .] in. And call[38] your brother[39] '*nekna*.' [Let] the little princes [. . .] before the king. To what land the king [goes,] let [them also] go."[40]

35. E. Laroche, *Catalogue des textes hittites* (2nd ed., Paris, 1971) 438: A = KUB 12.21, B = KBo 20.31. The script of B, if not Old Script, is clearly Middle Script and older than that of A. Otten (KBo 20, p. vii) and Laroche (*CTH* 438, p. 76) called this fragmentary piece a ritual, but this is almost certainly mistaken. Most of the lines seem to be addressed to a king. Nothing in a main clause describes what could be called a ritual act. *šuppiyaḫḫi* in B obv. 11 is part of a subordinate, probably temporal/conditional, clause. If kings could be "instructed" by other mortals, one might call this an instructions text. Who is the speaker? Perhaps an older king instructing his co-regent successor? Perhaps a god? I confess I have at present no idea.

36. The king is probably the one addressed here. Cf. the dupl. KUB 12.21 i 9-10 "O king, magnify the Stormgod, the Sungod, the Grain Deity, Miyatanzipa, . . . and Paḫḫur, and you will beome a 'swift' k[ing]."

37. If the "brother" of the following context should be an equal-ranking king, the "servant" here should be a vassal king. If so, the proposed restoration "[remove(?)]" should be considered as possibly better than "[punish(?)]", which is more fitting for a Hittite subject.

38. One expects an imperative form here, as everywhere in the main clauses of the context: *kueši . . . le* (B obv. 5), *paiškantaru* (B obv. 9), *iyanni* (A i 7), *šallanut* (A i 9) and *pī* (A i 13).

39. For the purpose of our lexical investigation it is irrelevant whether the "brother" here is a blood brother or an equal-ranking foreign king. But if a contrast "servant" versus "brother" is implied, the latter interpretation gains plausibility.

40. Reminiscent of F. Sommer and A. Falkenstein, *Die Hethitisch-akkadische Bilingue des Ḫattušili* I (ABAW, NF 16) (Munich, 1938), ii 42: "When it is the third year, let him (the young Muršili I) go on a campaign. (But bring him back safely.)"

Here the question is obviously: Who is calling to whom? The fact that the verbal ending is broken away leaves ambiguity. I have argued in note 38 for an imperative. My preferred restoration is 2 sg. "call!" which seems to accord with the context in which the addressee (2 sg.) is sometimes commanded (cf. *iyanni* "set out!", *šallanut* "magnify/ exalt!," *pai* "give!"), even if the meaning of these actions remains somewhat obscure. Possible too would be 3 sg. *ḫalzišša*[*u*] "let (your brother) call (you '*nekna*')." But this would leave the object "you" unexpressed in Hittite. If either "you" call "your brother," or vice versa, the interpretation of the vocative *nekna* as "brother" is impeccable. The Hittite word for "brother" is an a-stem (ŠEŠ-*aš*).

We may summarize. The translation of *pappa*(*n*)*nekneš* as "brothers having the same father" is quite plausible for the two OH passages examined, as is the translation "brother" for the apparently vocative *nekna* (compare the vocative of the a-stem noun *išḫā-mi* "my lord!"; a different i-vocalization is reflected in [ŠE]Š-*ni-mi* "O my brother" KUB 8.48 i 3) in CTH 438. In view of the new evidence showing the word *pappa-*ŠE[Š-*eš*] "brothers having the same father" it would seem unobjectionable to claim the following new translations: *nekna-* "brother" (= ŠEŠ), *pappanekna-*"paternal brother" (= *pappa-*ŠEŠ). The Luwian word for "brother," *nani-* is probably related.[41] C. Watkins[42] is of the opinion that *negna-* could be a derivative of *nega-* "sister," pointing out that in both KBo 22.178 + KUB 48.109 5′-6′ and KUB 29.1 ii 45ff. the female term precedes the male.

Although the idea to connect *pappa-*ŠEŠ with *pappanekna-* was mine from the beginning, I wish to acknowledge that Watkins independently came to the same conclusion after he had heard my paper in which the join of KBo 22.178 to KUB 48.109 was announced and the passage interpreted. In that short paper I did not publicly propose the equation with *pappanekneš*. Watkins' advocacy of the equation by letter encouraged me to propose it more forcefully here.

In column iii the synonyms *šanizzi-*"fine, pleasant, agreeable"[43] describes the table, stool and cup, while *aššu-* "good"[44] describes the kind of food and drink the persons in view do not enjoy.

The opposite of *aššu adatar* "good food" (iii 4) is *šalwinuš* "clods of mud" (iii 6; cf. Akk. *ṭiddu*), while the opposite of *aššu akuwatar=mit* "my good drink" (iii 5) is *mirmirruš* "muddy waters(?)" (iii 7; cf. Akk. *mê dalḫūti*). Unlike *šalwini-* (an oracle bird) which often occurs in the plural, *šalwina-* "mud, slime," is nowhere outside of this passage unambiguously plural.[45] *šalwinaš* (gen.) and *šalwinit* (instr.) could be plurals,[46] but there is no reason to suspect from their contexts that they are not singular. Given the meaning of *šalwina-* ("mud"), one would not normally expect it to occur in the plural. Here the plurals *šalwinuš* and *mirmirruš* express "portions" of muddy food and drink. It is hard to distinguish between *purut* "soil," *wilan-* "clay" and *šalwina-*. Constructions like *šalwinaš purut* "soil of *šalwina-*" (KUB 9.39 i 2), and *wilnaš šalwinit* "with *šalwina-* of clay"[47] (KBo 17.3 iv 14-15) show the difficulty.

41. Calvert Watkins wrote me (July, 1, 1987): "Jay Jasanoff noted also that a Common Anatolian **negna-* could very well come out as *nani-* in Luvian; *nanašri-*would be a further derivative."

42. In the same letter of July 1, 1987.

43. Ehelolf, *OLZ* (1933) 4f., Lohmann, *IF* 51 (1933) 325f., Friedrich, *HW* 181f., Beckman, StBoT 29 79 ("delicacies").

44. In the long article on *aššu-* in *HW*^{2} 1 492ff. I cannot find under sections II.2 and 3, and III.3 any usage listed where *aššu-* describes food. Similarly in *HED* 1 196-202 I find nothing close to the present use. In the passage [. . .] *a-aš-šu e-ez-za-at-ten mi-i-e-eš-du* KBo 12.39 i 8 (Otten, *MDOG* 94:10f.) one cannot exclude the possibility that *aššu* is an adverb. Likewise [. . .] *kuit a-*[*aš-š*]*u nu apat akkuškizi*, if the lacuna contained a dative of person, would mean "(s)he drinks what is preferred [by so-and-so]" KBo 23.49 iv 10.

45. Most of the inflected forms were already listed in Friedrich, *HW* 180.

46. Cf. Otten, StBoT 8:122 ("Sg./Pl. Instr.").

47. So translated by Güterbock, *Oriens* 10 (1957) 356. Or the *wilnaš* could go with the preceding *šinan*, as Otten (StBoT 8:37) prefers.

The occurrence of *=mit* "my" in *akuwatar=mit* (iii 5) is jarring. There has been no other indication in the fragment that the speaker/narrator refers to himself. One is reminded of *n=apa iyatar=mit udandu* in KUB 43.60 i 11-12, which is equally unprepared for. And since KUB 43.60 and our fragment already share the term *tenawaš*, one might entertain the possibility that they belong to the same composition. In that case KBo 22.178 + KUB 48.109 might preserve part of the mostly broken away second and third columns of KUB 43.60, in which the journey of the human soul on the "great road" (KUB 43.60 i 28-29) reaches its end and the traveler sees the nether world. The beginnings of lines preserved in KUB 43.60 ii are difficult to interpret.[48] More is preserved of KUB 43.60 iii.

1′	^{giš}[	]
2′	*a-i-ú*[	]
3′	*šu-up-pí* x[	]
4′	*x - zi*$^{?}$ *-an* x[	]
5′	*ḫa-x-pí-še-ni*[	]
6′	*a-x-x-x-an a*[-	]
7′	*a*[- *o*]-*x ti*$^{?}$*-it-t*[*a*(-) . . .	
8′	[*m*]*ar-ri-it-ti ga*[-	]
9′	KI .MIN KÙ.GI-*aš* KI [.MIN[49]	]
10′	AN.NA *ki-iš-ḫu-ut* [	]
11′	*ki-iš-ḫu-ut wa-x*[	]
12′	*x-aš ti-it-ti-x*[	]
13′	^{giš}*ḫa-aš-ša-al-li*[	]
14′	*la-ga-a-an ga-an*[-	]
15′	*ku-e-da-ni-ia x*[	]
16′	*ku-e-da-ni-ia-at*[-	]
17′	*ḫa-ra-aš*^{mušen} *ḫi-ik*[-	]
18′	ÍD-*i ma-al-ha*[-	]
19′	9-*an* 9-*an ki*[-	]
20′	*ar-ki-ir x*[	]
21′	UDU-*uš-za ki-i-x*[	]
22′	*ši-ia-at-ta*[	]
23′	*ar-ki-ir* x[	]
24′	*ud-da-a-ar x*[	]
25′	*me-mi-iš-ta x*[	]
26′	*e-eš-du x*[	]
27′	*a-ti-iš-š*[*a*-	]
28′	*nu-uš-ša-a*[*n*	]
29′	[*o* -]*x-aš*[	]

48. (ii 3) *i-l*[*a-li*. . .] (4) *an-n*[*a*-. . .] (5) *li-l*[*i-wa*-. . .] (6) *ḫar-ak*[-. . .] (7) *li-li-w*[*a*-. . .] (8) *nu-za* A-Š[*AR* . . .] (9) *ḫar-ga-x*[. . .] (10) *ú-e-e*[*ḫ*$^{?}$-. . .] (11) ÍD!?-*aš* [. . .] (12) KI.MIN *x*[. . .] (13) *e-eš*[-. . .] (14) ^{ši}*ša*-[. . .] (15) *e-e*[*š*-. . .] (16) *x*[. . .] (17 and 18 broken; 19) *ḫa*[*r*-. . .] (20) *ú*-[. . .] (21) *ḫu-u*-[. . .] (Traces in 22-23, then broken away completely.)

49. Or *ki*[-*iš-ḫu-ut* . . .].

". . . (9) 'ditto'. B[ecome] gold! (10) [. . .] become tin! (11) Become (10) [. . .]! . . . (13) stool [. . .] (14) inclined [. . .] (15) On which/every (?) [. . .] (16) On which/every (?) [. . .] it [. . .] (17) the eagle [. . .] (18) at the river the sacr[ificers (?) . . .] (19) nine and nine [. . .] (20) they divided. [. . .] (21) The sheep . .[. . .] (22) *šiyatta*[. . .] (23) they divided. [. . .] (24) words [. . .] (25) (s)he spoke. [. . .] (26) let it be (25) [. .-ed]! (26) [. . .] (27) an axe [. . .]"

The past tense verb forms *arkir* and *memišta* would seem to exclude the possibility that this section of the text is describing a ritual despite the presence of nouns and verbs which often occur in ritual contexts (*malḫa*[. . .], *ark-*, *šuppi* and, if it to be so restored, *ḫi-ik*[-*zi*]). Second person sg. imperative forms express commands usually associated with incantations, but it is also possible that they form part of a narrative in which persons expressed these desires. In sum, the preserved portions of column iii KUB 43.60 could, but do not have to, form a continuation of the scene in the realm of the dead described in KBo 22.178+.

Returning to KBo 22.178+, the word *wetriš*[. . .] which occurs in iii 8 is probably the same as the *witrišša* found in the Old Woman ritual KUB 9.4 iii 39 (restored in the parallel KUB 9.34 i 23) and in KBo 17.54 i 11-12: *mi-i-lu-li-ia-aš* [*ú-it-r*]*i-iš-ša la-a-ú* "may it loose the *wetriš* of the *miluli-*." In these passages *wetriš* seems to represent an undesirable condition of the *maluli*(*ya*)-/*miluli*(*ya*)-(a body tissue).[50] "Emaciation," "wasting" or "consumption" is a probable meaning. Such a meaning would fit in our passage too, following immediately upon the statement that the denizens of the realm of the dead have only mud to eat and filthy water to drink. *šer=šemet* and *šer=šamet* are attested; *šer=šamat* to my knowledge is not. Therefore I have preferred the construction with the dat. -loc. *=š*(*a*)*maš*. Line iii 11 with its *add*[*aš*] "father" may return to observations about family relations between the dead. *ḫa-az*[-. . .] in iii 11 could belong to the verb *ḫat-* "to dry up".This might describe the skin of the dead, who perhaps cannot use oil to prevent their skin from drying out.

Column iv of this tablet is only preserved in a few traces of ends of lines, one of which seems to say "Drink [. . .] [. .-*i*]*a*$^{?}$*-tar!*" (3′).[51] The following line contained a prohibition: "Don't [. . .]!"

50. *CHD* III/3 253f.

51. There is no obvious candidate to restore here among the possibilities listed in P. Reichert, "Glossaire Inverse du Hittite," *RHA* 73 (1975) 87-88: *iyatar*, *laḫḫiyatar*, *nakkiyatar*, *ḫaliyatar*, *ḫapalliyatar*, *ḫaštaliyatar*, *walliyatar*, *miyatar*, *annitatar*, *šiuniyatar*, *išpiyatar*, *šuppiyatar*, *luriyatar*, *šiyatar*, *aššiyatar*, *daššiyatar*, *tiyatar*, *šardiyatar*, *šarazziyatar*, *parkuyatar*. Perhaps despite the trace one should read either [. . . *w*]*a*$^{?}$*-a-tar e-ku* or [. . .]*x* A-*tar e-ku* "drink [. . .] water!"

A 3456: eine Sammlung von Merkurbeobachtungen

HERMANN HUNGER

In seinem Artikel über die Klassifikation nichtmathematischer astronomischer Texte beschrieb Abe Sachs in *JCS* 2 (1948) 287 auch den Text A 3456 im Oriental Institute in Chicago. Im Sommer 1978 befasste ich mich mit dieser Tafel und fertigte eine Umschrift an, die ich an Abe schickte. Wie nicht anders zu erwarten, hatte er sich viele Jahre zuvor schon damit beschäftigt. Er sandte mir Kopien seiner vorläufigen Umschrift und einiger dazugehöriger Berechnungen, wobei er mit der für ihn charakteristischen Bescheidenheit hinzufügte: "Please feel free to make whatever use you'd like of all this. A joint publication might be fun." Zu der geplanten gemeinsamen Publikation ist es leider nicht mehr gekommen. Ich möchte deshalb den Text zum Gedenken an Abe hier veröffentlichen und hoffe, dass dieser Artikel seine Zustimmung gefunden hätte.

Die Tafel A 3456 stammt aus Uruk. Sie hat 6 Kolumnen, die alle teilweise erhalten sind; allerdings ist vor allem die Rückseite ziemlich stark beschädigt. Die Tafel enthält hauptsächlich Merkurdaten, gelegentlich auch solche von anderen Planeten, und die Daten der Sonnenwenden und Äquinoktien, berechnet nach dem von O. Neugebauer entdeckten Schema.[1] Alle Daten beziehen sich auf die Jahre 116 bis 132 der Seleukidenära.

Zweierlei Arten von Merkurdaten kommen vor: 1. Erstmalige und letztmalige Sichtbarkeiten; 2. Konjunktionen mit Sternen oder Planeten.

1. Da die Bahn des Merkur näher an der Sonne liegt als die der Erde, kann er sich (von der Erde aus gesehen) nie sehr weit von der Sonne entfernen. Merkur kann sowohl Morgen- als auch Abendstern sein. Dementsprechend gibt es erste und letzte Sichtbarkeiten des Planeten (am Abend) im Westen und (am Morgen) im Osten. Nach einer letztmaligen Sichtbarkeit tritt der Planet in Konjunktion mit der Sonne und kommt nach einiger Zeit auf ihrer anderen Seite wieder zum Vorschein (erstmalige Sichtbarkeit).—Die Eintragungen über erste und letzte Sichtbarkeiten enthalten folgende Bestandteile:

1. O. Neugebauer, "Solstices and Equinoxes in Babylonian Astronomy during the Seleucid Period," *JCS* 2 (1948) 209ff.

a) Monat und Tag. Die Monatsnamen werden mit den in spätbabylonischen Texten üblichen Abkürzungen, ohne das Determinativ ITU, wiedergegeben. Wenn mehrere Daten innerhalb desselben Monats aufeinanderfolgen, wird der Monatsname nicht wiederholt (Ausnahme: iii 13ff.).

b) Tageszeit (Morgen oder Abend). Morgen (letzte Nachtwache vor Sonnenaufgang) wird durch *ina* ZALAG$_2$, Abend (erste Nachtwache) durch *ina* EN bezeichnet. *ina* EN ist wahrscheinlich eine Kurzform des Zeichens USAN, das sonst zur Bezeichnung der ersten Nachtwache in astronomischen Texten verwendet wird. Die Angabe der Tageszeit fehlt manchmal, ohne dass sich ein Grund dafür erkennen lässt.

c) Himmelsrichtung (Osten oder Westen). Osten wird durch KUR, Westen durch ŠÚ bezeichnet. Auch diese Angabe wird nur manchmal gemacht.

d) Tierkreiszeichen, manchmal durch "Anfang" oder "Ende" genauer bestimmt. Die Namen der Tierkreiszeichen sind in der üblichen Weise abgekürzt, vgl. die Liste in *ACT*, p. 38. Für Aries werden sowohl ḪUN als auch LU gebraucht.

e) ein Wort für Aufgang (IGI) oder Untergang (ŠÚ).

f) Angabe zur Helligkeit; steht nur gelegentlich. Meist steht dabei KUR$_4$ (akkad. *ba'il*) "er war hell."—Dreimal kommt nach KUR$_4$ zusätzlich LAL-*a* vor (iii 33, v 47, vi 1); es dürfte sich um eine Form von *šaqû* "hoch sein" handeln. Andere Texte verwenden dafür NIM-*a*, das vermutlich eine Form von *elû* darstellt. Wenn Merkur höher, also weiter von der Sonne entfernt, steht, ist er auch heller.

g) Zeit zwischen Aufgang und Untergang von Merkur und Sonne. Das Zeitintervall, in dem Merkur schon oder noch sichtbar war, wird mit NA bezeichnet; Lesung und wörtliche Bedeutung dieses Wortes sind unsicher.

h) ideales Datum des Phänomens. Falls der Planet aus irgend einem Grund an einem späteren Tag gesichtet wurde, als es bei günstigen Bedingungen möglich gewesen wäre, kann der Beobachter dies aus der grösseren Entfernung des Planeten von der Sonne erkennen, wodurch der Planet auch heller erscheint. Auch das Zeitintervall NA wird dann grösser. In diesem Fall wird zusätzlich zum beobachteten Datum ein ideales Datum angegeben, und zwar ein früheres bei Aufgängen und ein späteres bei Untergängen. Diese idealen Daten müssen berechnet worden sein; es ist unbekannt, welche Berechnungen verwendet wurden.

Weitere mögliche Angaben sind:

i) NU PAP (akkad. vermutlich *ul attaṣar*) "(ich habe) nicht beobachtet"; dadurch wird das davor genannte Phänomen als berechnet, nicht beobachtet, gekennzeichnet.[2]

k) DIB "vorbeigegangen" im Sinn von "ausgefallen"; die akkadische Entsprechung dürfte eine Form von *etēqu* "vorübergehen" sein. Manchmal findet ein Aufgang und der darauffolgende Untergang des Merkur so nahe bei der Sonne statt, dass sie nicht beobachtet werden können. In diesen Fällen wird zwar ein (offenbar berechnetes) Datum gegeben, aber durch DIB gekennzeichnet.[3]

2. Konjunktionen mit Sternen oder Planeten. Vielleicht sollte man besser nicht von Konjunktionen sprechen, sondern von "Vorübergängen," was dem akkadische Wort dafür (*etēqu*) entsprechen würde; wie gut die moderne Definition von Konjunktion als "gleiche Länge in der

2. Vgl. Sachs, *JCS* 2 (1948) 284.
3. Vgl. Sachs, *JCS* 2 (1948) 290, und O. Neugebauer, *Astronomical Cuneiform Texts* (Princeton and London, 1955), S. 471.

Ekliptik haben" auf diese Texte passt, ist noch nicht geklärt.[4] Die meisten der in A 3456 verzeichneten Konjunktionen sind solche mit sogenannten "Normalsternen"; es handelt sich um ekliptiknahe Sterne, die als Bezugspunkte für die Positionsangabe von Planeten dienen. Eine Liste dieser Normalsterne findet sich bei A. Sachs, "Babylonian Observational Astronomy," *The Place of Astronomy in the Ancient World*, Philosophical Transactions of the Royal Society of London A.276 (1974) S. 46; die Schreibung der Sternnamen ist im allgemeinen dieselbe wie hier. Für β Scorpii verwendet unser Text AN *šá* SAG GÍR-TAB statt *e šá* SAG GÍR-TAB; das erste Zeichen ist jeweils *elû* "oben befindlich" zu lesen. Der akkadische Name von θ Ophiuchi ist hier zu KUR *šá* PA abgekürzt.

Die Konjunktionen des Merkur mit Normalsternen sind in A 3456 nicht vollständig angeführt; wahrscheinlich waren auch in den Vorlagen, aus denen der Text zusammengestellt ist, nicht alle vorhanden. Einige mögen wegen schlechten Wetters nicht beobachtet worden sein, doch sind die Angaben über das Wetter nicht mit abgeschrieben worden. Die Entfernung zwischen Planet und Normalstern wird in "Ellen" und "Fingerbreiten" gemessen; 1 Elle = 2°, 1 Finger = 5′.

An manchen Stellen werden auch Konjunktionen des Merkur mit anderen Planeten erwähnt. In iii 16ff. kommen auch Phänomene anderer Planeten und ihre gegenseitigen Abstände vor; diese Angaben dürften aus der Vorlage mit übernommen worden sein, weil das nahe Zusammentreffen mehrerer Planeten von astronomischem und astrologischem Interesse war.

In vi 38 findet sich die Bemerkung "vom VII. bis XII. Monat nicht aufgeschrieben"; dieser Abschnitt fehlte also in der Vorlage. Das deutet daraufhin, dass die Vorlagen astronomische "Tagebücher" (diaries) waren, die üblicherweise ein halbes Jahr umfassen. Auf Diaries als Vorlagen deutet auch ii 48, wo die Jahreszahl 121 vor dem VII. Monat wiederholt wird, was nicht nötig eigentlich gewesen wäre; es erklärt sich aus dem Abschreiben aus einem Diary, das eine zweite Jahreshälfte enthielt und also mit dem VII. Monat begann. Auch kleine Verschiedenheiten in der Terminologie könnten auf die Verwendung unterschiedlicher Vorlagen zurückgehen, z.B. die Angabe der Himmelsrichtung, die nur manchmal steht und eigentlich unnötig ist, wenn die Tageszeit schon gegeben ist; am Morgen kann Merkur nur im Osten, am Abend nur im Westen stehen. Auch die Variation in der Schreibung des Tierkreiszeichens Aries (LU oder ḪUN) kann aus den Vorlagen übernommen sein.

Wegen des formelhaften Stils des Textes wird nur eine Transliteration geboten. Eine durchgehend akkadische Umschrift wäre mit zuvielen Unsicherheiten behaftet, weil die Lesung mancher Wortzeichen nicht feststeht. Soweit sie bekannt ist, sind oben akkadische Entsprechungen genannt worden. Für ein nicht gelesenes oder abgebrochenes Zeichen steht ein x, für eine Lücke unbestimmter Länge [. . . .]; nn steht für eine unbestimmte, nicht erhaltene Zahl. Statt der babylonischen Monatsnamen werden römische Zahlen verwendet. Ergänzungen der Merkurphänomene erfolgen auf Grund von Berechnungen mit Hilfe der Tafeln von B. Tuckerman[5]; natürlich habe ich keine Zahlenangaben, wohl aber Monatsnamen und Phänomene zu ergänzen versucht. Manches kann auch nach Paralleltexten ergänzt werden. Neben einzelnen Passagen in Diaries sind es vor allem die Texte *LBAT* 1265-7 und 1269+70, die herangezogen werden können. Sie werden hier nur zitiert, wenn sie zusätzliche Information bieten.

4. Vgl. O. Neugebauer, *A History of Ancient Mathematical Astronomy* (Berlin and New York, 1975), S. 546f.
5. *Planetary, Lunar, and Solar Positions 601 B.C. to A.D. 1* (Philadelphia 1962).

Umschrift

Kol. i

1 [1 *me* 16 BAR nn *ina* EN GU$_4$ SIG ŠUR GIGIR *šá* SI] 1 ½ KÙŠ
2 [nn *ina* EN GU$_4$ *e* ŠUR GIGIR *š*]*á* [UL]Ù 1 KÙŠ
3 [nn *ina* EN GU$_4$ *ina* SAG(?) MAŠ-MAŠ ŠÚ]
4 [GU$_4$ nn *ina* ZALAG$_2$ GU$_4$ *ina* SAG(?) MAŠ-MAŠ] IGI 25,30 NA-*su*
5 [SIG nn *ina* ZALAG$_2$ GU$_4$ *ina*] MAŠ-MAŠ ŠÚ NU PAP
6 [ŠU nn *ina* EN GU$_4$ . . . .] KÙŠ
7 [. . . .] 15 NA-*su*
8 [IZI nn *ina* EN GU$_4$ *ina* SAG(?) RÍ]N ŠÚ
9 [KIN nn *ina* ZALAG$_2$ GU$_4$ *ina* ABSIN IGI] ⌜x⌝ NA-*su in* 10 IGI
10 [DU$_6$ nn *ina* ZALAG$_2$ GU$_4$ *ina* RÍN ŠÚ nn] NA-*su in* 7 *ina* RÍN ŠÚ
11 [APIN nn *ina* EN GU$_4$ *ina* SAG(?) MÁŠ IGI] 15 NA-*su in* 25 IGI
12 [GAN nn *ina* EN GU$_4$ *ina*] MÁŠ ŠÚ NU PAP
13 [nn *ina* ZALAG$_2$ GU$_4$ *ina* SAG(?) MÁŠ] IGI KUR$_4$ 19 NA-*su in* 24 IGI
14 [ZÍZ nn *ina* ZALAG$_2$ GU$_4$ *ina* GU ŠÚ] NU PAP
15 [ŠE nn *ina* EN GU$_4$ *ina* ḪUN IGI] KUR$_4$(?) 15(?) NA-*su in* 11 IGI
16 [nn *ina* EN GU$_4$ SIG M]ÚL-MÚL 6 SI

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17 [1 *me* 17 BAR nn *ina* EN G]U$_4$ *e is le*$_{10}$ 4 KÙŠ
18 [nn *ina* EN GU$_4$] *ina* MÚL-MÚL ŠÚ NU PAP
19 [GU$_4$ nn *ina* ZALAG$_2$] GU$_4$ *ina* KUR IGI DIB
20 [SIG nn *ina* ZAL]AG$_2$ GU$_4$ *ina* KUR ŠÚ DIB
21 [ŠU nn *ina* E]N GU$_4$ *ina* SAG A IGI SIG *sin* ⌜⅔⌝ KÙŠ
22 [nn] *ina* EN GU$_4$ *ina* ŠÚ *ina* A ŠÚ 15 NA-*su*
23 [*i*]*n* 5 *šá* IZI ŠÚ
24 [KIN nn *ina* ZALA]G$_2$ GU$_4$ *ina* KUR *ina* RÍN IGI NU PAP
25 [DU$_6$ nn *ina* ZALA]G$_2$ GU$_4$ *ina* ABSIN ŠÚ 13 NA-*su*(?) *in* ⌜x *šá*⌝ KIN ŠÚ
26 [APIN nn *ina* E]N GU$_4$ *ina* PA IGI 16(?) NA-*su in* 12(?) *ina*(?) ABSIN(?) IGI
27 [GAN nn *ina* EN GU$_4$] *ina* ŠÚ *ina* MÁ[Š ŠÚ NU(?) PAP(?)]
28 [nn *ina* ZALAG$_2$ GU$_4$] *ina* KUR *ina* PA I[GI nn] NA-*su* in 22 IGI
29 [ZÍZ nn *ina* ZALAG$_2$ GU$_4$] *ina* KUR *ina* GU [ŠÚ] NU PAP
30 [ŠE nn *ina* EN] GU$_4$ *ina* SAG ḪUN I[GI . . . .] *in*(?) 5(?) IGI
31 [. . . .] ⌜x x⌝ *dele-bat* ⌜x⌝ KÙŠ
32 [nn *ina* EN] GU$_4$ SIG MÚL IGI *šá* SA[G LU nn] KÙŠ
33 [nn *ina* EN GU$_4$ SIG] MÚL *ár šá* SAG LU 4(?) ½ KÙŠ 22 <. . .> GU$_4$ *e dele-bat* 2 KÙŠ

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34 [1 *me* 18 BAR nn *ina* EN G]U$_4$ *ina* ŠÚ *ina* MÚL ŠÚ NU PAP
35 GU$_4$ 14 [*ina* ZALAG$_2$] GU$_4$ *ina* KUR IGI DIB 27 *ina* ZALAG$_2$ GU$_4$ *ina* KUR ŠÚ DIB
36 SIG 26 *ina* E[N] GU$_4$ ina ALLA IGI 16 NA-*su in* 19(?) IGI
37 [ŠU nn] *ina* EN GU$_4$ *e* LUGAL 6 SI IZI 3 GU$_4$ *ina* EN(?) *ina* A ŠÚ
38 [KIN] ⌜3⌝ *ina* ZALAG$_2$ GU$_4$ *ina* A IGI KUR$_4$ 15 NA-*su in* 1 IGI

39 [nn *ina*] ZALAG$_2$ GU$_4$ *ina* ABSIN ŠÚ NU PAP
40 [A]PIN 22 *ina* EN GU$_4$ *ina* PA IGI 15 NA-*su in* 20 IGI
41 [2]9(?) *ina* EN GU$_4$ *ina* ŠÚ *ina* PA ŠÚ NU PAP
42 [GAN nn *ina*] ZALAG$_2$ GU$_4$ *ina* KUR *ina* PA IGI DIR NU PAP
43 [A]B 8 ^{d}*šamaš*$_2$ GUB-*za* 27 GU$_4$ *ina* ZALAG$_2$(*sic*) *ina* MÁŠ ŠÚ NU PAP
44 [ŠE] 1 *ina* EN GU$_4$ *ina* ŠÚ *ina zib* IGI 15 NA-*su*
45 [*in*] 26(?) *šá* ZÍZ IGI
46 [DIR nn *ina* EN G]U$_4$ *ina* ŠÚ *ina* LU ŠÚ NU PAP 11 LÁL-*tì*
47 [nn *ina* ZALAG$_2$ G]U$_4$ *ina* KUR IGI DIB

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48 [1 *me* 19 BAR nn *ina* ZALAG$_2$ GU$_4$] *ina* KUR ŠÚ DIB
49 [GU$_4$ nn *ina* EN GU$_4$ *ina*] MAŠ IGI KUR$_4$ 15 NA-*su in* 17 IGI
50 [nn *ina* EN GU$_4$ SIG MAŠ-MAŠ] *ár* 2 KÙŠ 10 SI
51 [nn *ina* EN GU$_4$ *e*] BABBAR 1 ⅔ KÙŠ

Kol. ii

1 1 *me* 19 GU$_4$ 28 *ina* EN GU$_4$ *e ár šá* ALLA *šá* ULÙ ⅔ K[ÙŠ]
2 SIG 6 *ina* EN GU$_4$ SIG SAG A 4 KÙŠ
3 15 *ina* EN GU$_4$ SIG LUGAL ⅔ KÙŠ
4 29 *ina* EN GU$_4$ *ina* ŠÚ *ina* A ŠÚ DIR NU PAP
5 ŠU 28 *ina* ZALAG$_2$ GU$_4$ *ina* KUR *ina* SAG A IGI 16 NA-*su ina* 24 IGI
6 IZI 2 *ina* ZALAG$_2$ GU$_4$ *e* LUGAL 4 SI
7 [1]2(?) *ina* ZALAG$_2$ GU$_4$ *ina* A ŠÚ 13(?) NA-*su in* 16 *ina* A ŠÚ
8 [KI]N 16 LÁL-*tú*
9 DU$_6$ 21 *ina* EN GU$_4$ *ina* GÍR-TAB IGI 15 N[A-*s*]*u*
10 *in* 15 IGI x[x x] x
11 25(?) [*ina* EN GU$_4$ (*ina* ŠÚ) *ina* x ŠÚ DI]R NU [PAP]
12 APIN 13 *ina* ZALAG$_2$ G[U$_4$ (*ina* KUR) *ina* G]ÍR-TAB IGI KUR$_4$ 19,30 NA-*su*
13 *in* 8 IGI
14 15 *ina* ZALAG$_2$ GU$_4$ *e* SI$_4$ 2 ½ KÙŠ
15 27 *ina* ZALAG$_2$ GU$_4$ *e* KUR *šá* PA 1 KÙŠ 10 SI
16 GAN 20 *ina* ZALAG$_2$ [G]U$_4$ *ina* KUR *ina* PA ŠÚ NU PAP
17 ZÍZ 1 *ina* E[N GU$_4$] *ina zib* IGI KUR$_4$ 18 NA-*su*
18 *in* 28(?) [*šá*] AB *ina* TIL GU IGI
19 15 *ina* EN GU$_4$ [*ina* ŠÚ] *ina zib* ŠÚ NU PAP
20 ŠE 22 *ina* ZALAG$_2$ G[U$_4$ *ina zib* I]GI NU PAP U$_4$ BI LÁL-*tú*

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21 1 *me* 20 BAR 10 *ina* ZALAG$_2$ GU$_4$ *i*[*na*(?) KUR(?) *i*]*na* LU ŠÚ NU PAP
22 GU$_4$ 12 *ina* EN GU$_4$ *ina* ŠÚ *ina* MAŠ IGI 13 NA-*su ina* 11 IGI
23 23 *ina* EN GU$_4$ SIG MAŠ-MAŠ *ár* 2 ½ KÙŠ
24 SIG 22 *ina* EN GU$_4$ *ina* ALLA ŠÚ NU PAP
25 ŠU 27 *ina* ZALAG$_2$ GU$_4$ *ina* A IGI 16 NA-*su* <*ina*> 22 IGI

IZI 10 *ina* ZALAG$_2$ GU$_4$ *ina* A ŠÚ NU PAP
DU$_6$ 7 *ina* EN GU$_4$ *ina* ŠÚ IGI DIB
21 *ina* EN GU$_4$ *ina* ŠÚ ŠÚ DIB
APIN 8 *ina* ZALAG$_2$ GU$_4$ *ina* TIL RÍN IGI KUR$_4$ 20 NA-*su*
in 2 IGI
21 *ina* ZALAG$_2$ GU$_4$ *e* AN *šá* SAG GÍR-TAB 6 SI
26 *ina* ZALAG$_2$ GU$_4$ *e* SI$_4$ 3 KÙŠ
GAN 13 *ina* ZALAG$_2$ GU$_4$ *ina* A(*sic*) ŠÚ DIR NU PAP
AB 22 *ina* EN GU$_4$ *ina* MÁŠ IGI KUR$_4$ 14(?) NA-*su* *ina* 20 IGI
ZÍZ 11 *ina* EN GU$_4$ *ina zib* ŠÚ NU PAP
Š[E nn *ina* ZA]LAG$_2$ GU$_4$ *ina* TIL GU IGI 14 NA-*su* *ina* 4 IGI
19 [*ina* ZALAG$_2$] GU$_4$ *ina* GU(*sic*) ŠÚ NU PAP

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1 *me* 21 BAR 3 LÁL-*tú*
GU$_4$ 7 *ina* EN GU$_4$ *ina* [ŠÚ *ina* TI]L MÚL IGI 14,30 NA-*su* *ina* 6 IGI
SIG *dele-bat* 1 + [x] KÙŠ
17 *ina* E[N] GU$_4$ *e* MAŠ *šá* SIPA 3 ½ KÙŠ
27 *ina* EN GU$_4$ SIG MAŠ-MAŠ IGI [nn K]ÙŠ
SIG 2 *ina* EN GU$_4$ SIG MAŠ-MAŠ *ár* [nn K]ÙŠ
16 *ina* EN GU$_4$ *ina* SAG ALLA ŠÚ NU PAP
ŠU 17 *ina* ZALAG$_2$ GU$_4$ *ina* ALLA IGI NU PAP
IZI 5 [*ina* ZALAG$_2$ G]U$_4$ *ina* ALLA ŠÚ TA 3 *k*[*i*] PAP NU IGI
KIN 21 *ina* EN GU$_4$ IGI DIB DU$_6$ 5 GU$_4$ [*ina* Š]Ú ŠÚ DIB
1 *me* 21 DU$_6$ 8 LÁL-*tú*(?) APIN 2 *ina* ZALAG$_2$ GU$_4$ *ina* RÍN IGI 15 NA-*s*[*u*]
[*i*]*n* 28 *šá* DU$_6$ IGI
⌜16⌝ *ina* ZALAG$_2$ GU$_4$ SIG RÍN *šá* SI 3 KÙŠ
GAN 5 *ina* ZALAG$_2$ GU$_4$ *ina* GÍR-TAB ŠÚ TA 1 *ki* PAP NU IGI
AB 11 ^{d}UTU GUB-*za*

Kol. iii

[1 *me* 21 . . . .]
[. . . .] x x [. . . .]
[. . . .] *ina zib* ŠÚ (?) [. . . .]
[. . . .] *ár* x [. . . .]

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1 *me* 22 BAR [. . . .]
13 *ina* EN [GU$_4$ SIG ŠUR GIGIR *šá* SI nn KÙŠ]
15 *ina* EN G[U$_4$ *e* ŠUR GIGIR *šá* ULÙ nn KÙŠ]
GU$_4$ 8 *ina* EN [GU$_4$ *ina* MAŠ-MAŠ ŠÚ NU PAP]
SIG 15 *ina* ZALAG$_2$ G[U$_4$ *ina* MAŠ-MAŠ IGI nn] NA-*su* *in* 1[0 IGI]
16 ^{d}UTU GUB 20 *ina* ZALAG$_2$ G[U$_4$ SIG MAŠ-MAŠ] IGI 5 KÙŠ
[nn] *ina* ZALAG$_2$ GU$_4$ *ina* SAG ALLA ŠÚ NU PAP

IZI 3 *ina* EN GU$_4$ *ina* ABSIN IGI [KU]R$_4$ 20 N[A-*su* . . . .]
<<KIN>> 18 <*ina* EN> GU$_4$ *ina* ŠÚ *ina* ABSIN ŠÚ NU PAP KIN 19 L[ÁL-*tú*]
KIN 25 *ina* ZALAG$_2$ GU$_4$ *ina* ABSIN IGI 15,30 NA-*su* *ina* 20+[nn IGI]
30 *ina* ZALAG$_2$ GU$_4$ *e* SA$_4$ *šá* ABSIN 1 ½ KÙŠ
DU$_6$ 10(*sic*) *ina* ZALAG$_2$ GU$_4$ *e* AN ⅝ KÙŠ
DU$_6$ 1 AN *ina* SAG RÍN IGI SIG 14 NA-*su*
e(*sic*) SA$_4$ *šá* ABSIN 2 KÙŠ *e* GU$_4$-UD [nn x]
13 BABBAR *ina* RÍN IGI SIG 11 NA-*su* *in* 12 [IGI]
e GU$_4$-UD 3 KÙŠ *e* AN 4 KÙŠ *ana* Á [SI NIM]
17 <*ina* ZALAG$_2$> GU$_4$ *e* BABBAR 6 SI
23 *ina* ZALAG$_2$ GU$_4$ *ina* RÍN ŠÚ 11 NA-*su* *in* 24 [ŠÚ]
GAN 13 *ina* EN GU$_4$ *ina* GÍR-TAB IGI KUR$_4$ 15 NA-*su* *i*[*n* nn IG]I
22 *šamaš*$_2$ GUB-*za* AB 1 *ina* EN GU$_4$ *ina* GU ŠÚ
TA 27 *šá* GAN *ki* PAP NU IGI
AB 15 *ina* ZALAG$_2$ GU$_4$ *ár* SI MÁŠ 1 KÙŠ *ana* ULÙ 2 KÙŠ SIG
e *dele-bat*(*sic*) 1 KÙŠ *ana* ŠÚ ½ KÙŠ LAL IGI 16 NA-*su*
in 13 GU$_4$ *ina* KUR *ina* MÁŠ IGI
AB 20 *ina* ZALAG$_2$ GU$_4$ SIG SI MÁŠ 2 KÙŠ
24 *ina* ZALAG$_2$ GU$_4$ SIG GENNA 2 KÙŠ
ZÍZ 14 *ina* ZALAG$_2$ GU$_4$ *ina* GU ŠÚ 15 NA-*su* *ina* 15 Š[Ú]
ŠE 25 LÁL-*tì*

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1 *me* 23 BAR 1 *ina* EN GU$_4$ *ina* MÚL IGI KUR$_4$ LAL-*a* 17(?) [NA-*su*]
in 26 *šá* ŠE IGI
BAR 3 *ina* EN GU$_4$ SIG MÚL-MÚL [nn x]
10 *ina* EN GU$_4$ *e* *is* *le*$_{10}$ 4(?) [KÙŠ]
GU$_4$ 1 *ina* EN GU$_4$ *ina* TIL MÚL-MÚL Š[Ú]
SIG 11 *ina* ZALAG$_2$ GU$_4$ *ina* MAŠ-MAŠ IGI KUR$_4$ [. . . .]
20(?) *ina* ZALAG$_2$ GU$_4$ *ina* MAŠ-MAŠ ŠÚ [
ŠU 23 *ina* EN GU$_4$ *ina* A IGI 15(?) [NA-*su* . . . .]
IZI 19(?) [*ina* EN] GU$_4$ *ina* ABSIN ŠÚ [. . . .]
KIN 21 *ina* ZALAG$_2$ GU$_4$ *ina* ABSIN [IGI . . . .]
DU$_6$ 11 *ina* ZALAG$_2$ GU$_4$ *ina* RÍN Š[Ú]
GAN 7 *ina* EN GU$_4$ *ina* PA IG[I . . . .]
20 *ina* EN GU$_4$ *ina* MÁŠ ŠÚ [. . . .]
AB 8 *ina* ZALAG$_2$ GU$_4$ *ina* TIL PA I[GI . . . .]
28(?) *ina* ZALAG$_2$ GU$_4$ SIG SI [MÁŠ nn x]
ZÍZ 17 *ina* ZALAG$_2$ GU$_4$ *ina* GU ŠÚ [. . . .]
ŠE 22 *ina* EN GU$_4$ *ina* ŊUN [IGI . . . .]
23 *ina* EN GU$_4$ SIG *ár* *šá* S[AG ŊUN nn KÙŠ]
DIR 6 LÁL-*tú* 13 *ina* E[N GU$_4$ SIG MÚL-MÚL nn KÙŠ]
DIR 23 *ina* EN GU$_4$ *ina* MÚL-[MÚL ŠÚ]

Kol. iv

1 1 *me* 24 BAR 28 *ina* ZALAG$_2$ GU$_4$ ⌜x x⌝ [. . . .]
2 GU$_4$ ⌜x⌝ *ina* ZALAG$_2$ GU$_4$-UD *ina* KUR ŠÚ [DIB]
3 SIG 12 [*ina* EN G]U$_4$ *ina* AL[L]A IGI 25,30 N[A-*su* . . . .]
4 <ŠU> 22 *ina* [EN GU$_4$ *ina*] SAG ABSIN ŠÚ
5 IZI 10+[nn *ina* ZALAG$_2$ G]U$_4$ *ina* A IGI 15+[nn NA-*su*]
6 KIN 6 *ina* ZALAG$_2$ GU$_4$ *ina* ABSIN(?) ŠÚ 12,30(?) [. . . .]
7 12(?) ⌜x⌝ [. . . .] ⌜x x⌝
8 [. . . .] *in* 2 IGI
9 [APIN nn *ina* EN GU$_4$] *ina* PA ŠÚ 13 NA-*su* [*ina*] 18(?) Š[Ú]
10 [nn *ina* ZALAG$_2$ GU$_4$ *ina* x] IGI 11(?) NA-*su*
11 [*i*]*n* 10+[nn IGI]
12 [. . . .] 20+[nn . . . .] GU$_4$ [. . . .]
13 AB [nn *ina* ZALAG$_2$ GU$_4$ *ina* x ŠÚ . . . .]
14 ZÍZ 10+[nn *ina* EN GU$_4$ *ina* x IGI] 15(?) [NA-*su*(?) . . . .]
15 19 [*ina* EN GU$_4$ SIG . . . .] *nu-nu* 2 [x]
16 Š[E](?) 1(?) [*ina* EN GU$_4$ SIG IGI *šá* SA]G ḪUN 3(?) [KÙŠ]
17 [nn *ina* EN GU$_4$ SIG *ár šá* SA]G ḪUN(?) 4 K[ÙŠ]
18 [. . . . TA] 11(?) *ki* PAP N[U IGI]

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19 [1 *me* 25 BAR nn *ina* ZALAG$_2$ GU$_4$ *ina* KUR IGI] DIB
20 [GU$_4$ nn *ina* ZALAG$_2$ GU$_4$ *ina* KUR ŠÚ D]IB
21 SIG 5(?) *ina* E[N GU$_4$ *ina* ALLA IGI . . . .]
22 16 *ina* EN GU$_4$ x x x x
23 2[1(?) *ina* EN GU$_4$] SIG LUGAL 1 SI
24 [ŠU nn *ina* EN GU$_4$ (*ina* ŠÚ) *ina*] ⌜A⌝(?) ŠÚ(?) TA 12 *ki* PAP NU ⌜IGI⌝
25 [IZI nn *ina* ZALAG$_2$ GU$_4$ *ina* A *ár*(?)] LUGAL(?) 3 KÙŠ IGI 15(?) NA-*su ina* ⌜x⌝ IGI
26 [KIN nn *ina* ZALAG$_2$ GU$_4$ *ina*] ABSIN ŠÚ 11(?) NA-*su ina* 2 ŠÚ 2[2] LÁL-*tú*
27 A[PIN nn *ina* E]N GU$_4$ *ina*(?) GÍR-TAB(?) IGI(?) 16(?) NA-*su*(?)
28 *in* 28 *šá* DU$_6$ IGI
29 14 *ina* EN GU$_4$ *ina* ŠÚ *ina* PA ŠÚ TA 12 *ki* PAP NU IGI
30 25 *ina* ZALAG$_2$ GU$_4$ <*ina*> GÍR-TAB IGI KUR$_4$ 18 NA-*su ina* 24 I[GI]
31 GAN 8 *ina* ZALAG$_2$ GU$_4$ *e* KUR *šá* PA 1 ½ KÙŠ
32 AB 8 *ina* ZALAG$_2$ GU$_4$ *ina* MÁŠ ŠÚ NU PAP
33 ZÍZ 14 *ina* EN GU$_4$ *ina zib* IGI KUR$_4$ 16 NA *ina* 11 IGI
34 ŠE 1 *ina* EN GU$_4$ *ina zib* ŠÚ

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35 1 *me* 26 BAR 26 *ina* ZALAG$_2$ GU$_4$ *ina* KUR ŠÚ DIB
36 GU$_4$ 26 *ina* EN GU$_4$ *ina* MAŠ IGI 12(?) NA-*su* [. . . .]
37 SIG 2 *ina* EN GU$_4$ SIG MAŠ-MAŠ IGI ⅚ KÙŠ
38 5 *ina* EN GU$_4$ SIG MAŠ *ár* ⌜2⌝ KÙŠ
39 14 *ina* EN GU$_4$ SIG *ár* <*šá*> ALLA *šá* ULÙ 1 U(?)

40 23 *ina* EN GU$_4$ SIG SAG A 4 KÙŠ 29 [*šamaš*$_2$] GUB-*za*
41 ŠU 11 *ina* EN GU$_4$ *ina* ALLA ŠÚ TA 8 *ki* PAP NU IGI
42 IZI 6 *ina* ZALAG$_2$ GU$_4$ *ina* TIL ALLA IGI KUR$_4$(?) *ina* 4 IGI
43 28 *ina* ZALAG$_2$ GU$_4$ *ina* A ŠÚ DU$_6$ 3 LÁL-*tì*
44 D[U$_6$] 21 *ina* EN GU$_4$ IGI DIB APIN 6(?) GU$_4$ *ina* ŠÚ ŠÚ [DIB]
45 [API]N 21 *ina* ZALAG$_2$ GU$_4$ *ina* GÍR-TAB IGI 14 NA-*su ina* 19 [IGI]
46 [2]7 *ina* ZALAG$_2$ GU$_4$ *e* AN *šá* SAG GÍR-TAB ½ KÙŠ
47 [GA]N 5 *ina* ZALAG$_2$ GU$_4$ *e* SI$_4$ 3 KÙŠ
48 [A]B 1 *ina* ZALAG$_2$ GU$_4$ *ina* PA ŠÚ 6 ^{d}*šamaš*$_2$ G[UB]
49 ZÍZ 8 *ina* EN [G]U$_4$ *ina* G[U IGI] ⌜x x⌝
50 ⌜x⌝ [. . . .]

Kol. v

1 1 *m*[*e* 26 x] ⌜x⌝ *ina* EN(?) GU$_4$ *ina* [x ŠÚ . . . .]
2 [. . . . *ina* ZALAG$_2$ GU$_4$ *ina* x] IGI 15 NA-*su*
3 [. . . . *ina* ZALAG$_2$ GU$_4$] SIG AN ⅝ KÙŠ
4 [. . . .] ⌜x⌝
5 DIR 9 [LÁL-*tì* nn *ina* ZALAG$_2$ GU$_4$ *ina* L]U ŠÚ NU PAP

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6 1 *me* 2[7 BAR nn . . . . N]U PAP
7 10+[nn . . . .]
8 GU$_4$ [nn . . . .]
9 [. . . .]
10 SIG [nn . . . .] ŠÚ
11 [. . . .] IGI
12 [. . . .]
13 DU$_6$ ⌜14⌝ [. . . .]
14 19 *ina* ZALAG$_2$ GU$_4$ [*e* RÍN *šá* ULÙ nn] KÙŠ
15 25 *ina* ZALAG$_2$ G[U$_4$ SIG RÍN *šá* SI nn] KÙŠ
16 APIN 4 *ina* Z[ALAG$_2$ GU$_4$ x x *šá* SAG GÍR-TAB nn x]
17 [. . . .]
18 [GA]N 2 *ina* ZALAG$_2$ GU$_4$ *ina* SAG PA ŠÚ NU [PAP]
19 AB 1 *ina* EN GU$_4$ *ina* GU IGI 13 NA-*su* [. . . .]
20 24 *ina* EN GU$_4$ *ina* TIL GU ŠÚ :: 1 ⌜x⌝ [. . . .]
21 ZÍZ 10 *ina* ZALAG$_2$ GU$_4$ *ina* GU IGI
22 ŠE 12 *ina* ZALAG$_2$ GU$_4$ *ina zib* ŠÚ 20 [LÁL-*tì*]

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23 1 *me* 28 BAR 17 *ina* EN GU$_4$ *ina* MÚL I[GI . . . .]
24 20 [*ina* EN GU$_4$] SIG ŠUR GIGIR *šá* [SI nn x]
25 23 *ina* EN GU$_4$ *e* ŠUR GIGIR *šá* UL[Ù nn x]
26 29 [*ina* EN GU$_4$] *e* IGI *šá še-pít* MAŠ-MAŠ [nn x]
27 GU$_4$ 1 *ina* EN GU$_4$ *e ár šá še-pít* MAŠ-MAŠ [nn x]

4 *ina* EN GU_4 *e* MAŠ *šá* SIPA [nn x]
25 *ina* EN GU_4 *ina* MAŠ-MAŠ ŠÚ
SIG 26 *ina* EN(*sic*) GU_4 *ina* KUR *ina* MAŠ-MAŠ IGI NU PAP
ŠU 17 *ina* EN(*sic*) GU_4 *ina* ALLA ŠÚ NU PAP
KIN 1 *ina* $ZALAG_2$(*sic*) GU_4 *ina* KUR(*sic*) IGI DIB 11 GU_4 *ina* ŠÚ ŠÚ DIB
DU_6 11 *ina* $ZALAG_2$ GU_4 *ina* RÍN IGI
APIN 11 *ina* $ZALAG_2$ GU_4 *ina* GÍR-TAB ŠÚ DIR NU PAP
GAN 26 *ina* EN GU_4 *ina* MÁŠ IGI DIR NU PAP
AB 17 *ina* EN GU_4 *ina* GU ŠÚ DIR NU PAP
ZÍZ 2 *ina* $ZALAG_2$ GU_4 *ina* MÁŠ IGI NU PAP
ŠE 12 *ina* $ZALAG_2$ GU_4 *ina zib* ŠÚ NU PAP

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1 *me* 29 BAR 12 *ina* EN GU_4 *ina* MÚL IGI 14 NA-*su ina* 11 IGI
17 GU_4 SIG(*sic*) MÚL-BABBAR 2 KÙŠ *ana* NIM ½(?) KÙŠ DIB
19 *ina* EN GU_4 *e is* le_{10} 1+[x x]
28 *ina* EN GU_4 SIG ŠUR GIGIR *šá* SI 1 KÙŠ 10 SI
[. . . . G]U_4 [*e* ŠU]R GIGIR *šá* ULÙ 2 KÙŠ
[GU_4 nn] *ina* EN GU_4 *ina* MAŠ-MAŠ ŠÚ DIR NU PAP
[SIG] 24 *ina* $ZALAG_2$ GU_4 *ina* KUR <*ina*> MAŠ-MAŠ IGI NU PAP
[ŠU nn] *ina* $ZALAG_2$ GU_4 *ina* TIL MAŠ-MAŠ ŠÚ NU PAP
[IZI 1]4 *ina* EN GU_4 *ina* SAG ABSIN IGI KUR LAL-*a*
[1]5 NA-*su in* 12 IGI
[KIN nn *ina* EN G]U_4 *ina* ABSIN ŠÚ [. . . .] ⌜x⌝ ŠÚ

Kol. vi

[1 *me* 29 DU_6 nn *ina* $ZALAG_2$ GU_4 . . . . IGI] KUR_4 LAL-*a*
[nn NA-*su in* nn] IGI
[nn *ina* $ZALAG_2$ GU_4 *e* SA_4(?) *š*]*á* ABSIN 1 ½ KÙŠ
[APIN nn *ina* ZAL]AG_2 GU_4 [*ina* RÍN ŠÚ nn N]A-*su ina* 1 ŠÚ
[GAN nn *ina*] EN GU_4 [*ina* MÁŠ(?) IGI 1]3 NA-*su ina* 23 IGI
[AB nn *ina* EN] GU_4 *in*[*a* MÁŠ ŠÚ] NU PAP
[nn] *ina* $ZALAG_2$ GU_4 [*ina* MÁŠ IGI nn] NA-*su ina* 24 IGI
[. . . .] *ina* IGI *sin* 1(?) [KÙŠ] *ana* ŠÚ LAL
ZÍZ 9 *ina* EN(*sic*) GU_4 SIG SI MÁŠ 2 KÙŠ
ŠE 7 *ina* EN(*sic*) GU_4 *ina* GU [ŠÚ] NU PAP
DIR 8 *ina* EN GU_4 *ina* [x IGI] NU PAP 12 LÁL-*tú*
27(?) [. . . .] 10(?) SI
[nn] *ina* EN GU_4 [. . . .]

[1 *me*] 30 BAR 11 *ina* EN GU_4 [*ina* MÚL(-MÚL) ŠÚ NU] PAP
[GU_4] 18 *ina* $ZALAG_2$ GU_4 *ina* TIL MÚL [IGI NU] PAP
20 *ina* EN [GU_4 . . . .]
[SIG . . . .] 29(?) IGI

[IZI . . . .]
[KIN] 3 *ina* $ZALAG_2$ [GU_4 *ina* x] IGI [. . . .]
27(?) *ina* $ZALAG_2$ GU_4 *ina* SA[G(?) x ŠÚ . . . .]
[A]PIN 9 *ina* EN GU_4 *ina* PA [IGI . . . .]
[G]AN 6 *ina* EN [GU_4] *ina* [x ŠÚ . . . .]
[1]7 *ina* $ZALAG_2$ GU_4 [. . . . IGI 20 *šamaš*$_2$ G]UB-*za*
AB 1 *ina* $ZALAG_2$ [GU_4 . . . .]
[. . . .] NU PAP
[. . . .] 3 KÙŠ
[. . . .] KÙŠ

[1 *me* 31] BAR 1 *ina* EN GU_4 *ina* ŠÚ *ina* MÚL ŠÚ 17 NA-*su*
in 4 ŠÚ
[G]U_4 20 *ina* $ZALAG_2$ GU_4 *ina* KUR IGI DIB
[SI]G 21 *ina* EN GU_4 *ina* ALLA IGI *ina* 19 IGI
[ŠU] 2(?) *ina* EN <GU_4> *e* LUGAL 1 KÙŠ
[nn] *ina* EN <GU_4> SIG GIŠ.KUN A 4 KÙŠ
[nn *ina* E]N GU_4 *e dele-bat* 1 KÙŠ
[IZI] 3(?) *ina* EN GU_4 *ina* A ŠÚ TA 1 *ki* PAP NU IGI
[nn] *ina* $ZALAG_2$ GU_4 *ina* A IGI 14,30 NA-*su ina* 23 IGI
[KIN nn *ina* $ZALAG_2$ G]U_4 *ina* ABSIN ŠÚ NU PAP
[. . . .] TA DU_6 EN ŠE NU SAR

[1 *me* 32 . . . . NU] PAP
[. . . . I]GI DIB
[. . . . ŠÚ] DIB
[. . . . IGI] 15 NA-*su*

(Ca. 9 bis 10 Zeilen fehlen bis zum Ende der Kolumne)

Übersetzung

In der Übersetzung versuche ich die abkürzende Schreibweise des Textes durch eine Art Telegrammstil nachzuahmen. "Abends" und "morgens" verwende ich für "erste Nachtwache" bzw. "letzte Nachtwache"; ES und LS für "erstmalige Sichtbarkeit" und "letztmalige Sichtbarkeit" (nach bzw. vor einer Konjunktion des Merkur mit der Sonne).

Kol. i

1 [Jahr 116, I nn abends, Merkur] 1 ½ Ellen [unter β Tauri]
2 [nn abends, Merkur] 1 Elle [über ζ Tauri]
3 [nn abends, LS des Merkur im Anfang(?) von Gemini]
4 [II nn morgens,] ES [des Merkur im Anfang(?) von Gemini]; Merkuraufgang bis Sonnenaufgang 25° 30′
5 [III morgens,] LS [des Merkur in] Gemini, nicht beobachtet
6 [IV nn abends, Merkur . . . .] Ellen
7 [. . . .] Sonnenuntergang bis Merkuruntergang 15°
8 [V nn abends,] LS [des Merkur im Anfang(?) von Lib]ra
9 [VI nn morgens, ES des Merkur in Virgo;] Merkuraufgang bis Sonnenaufgang ⌜x⌝; (ideale) ES am 10.
10 [VII nn morgens, LS des Merkur in Libra;] Merkuraufgang bis Sonnenaufgang [nn°]; (ideale) LS am 7. in Libra
11 [VIII nn abends, ES des Merkur im Anfang(?) von Capricornus;] Sonnenuntergang bis Merkuruntergang 15°; (ideale) ES am 25.
12 [IX nn abends,] LS [des Merkur in] Capricornus, nicht beobachtet
13 [nn morgens,] ES [des Merkur im Anfang(?) von Capricornus;] er war hell, Merkuraufgang bis Sonnenaufgang 19°, (ideale) ES am 24.
14 [XI nn morgens, LS des Merkur in Aquarius,] nicht beobachtet
15 [XII nn abends, ES des Merkur in Aries;] er war hell(?), Sonnenuntergang bis Merkuruntergang 15°(?), (ideale) ES am 11.
16 [nn abends, Merkur] 6 Finger [unter] η Tauri

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17 [Jahr 117, I nn abends,] Merkur 4 Ellen über α Tauri
18 [nn abends,] LS [des Merkur] in Taurus, nicht beobachtet
19 [II nn morgens,] ES des Merkur im Osten, ausgefallen
20 [III nn mor]gens, LS des Merkur im Osten, ausgefallen
21 [IV nn aben]ds, ES des Merkur am Anfang von Leo; er war lichtschwach, ⌜⅝⌝ Ellen unter dem Mond
22 [nn] abends, LS des Merkur im Westen in Leo; Sonnenuntergang bis Merkuruntergang 15°,
23 (ideale) LS am 5.V.
24 [VI nn morgens,] ES des Merkur im Osten in Libra, nicht beobachtet
25 [VII nn morgens,] LS des Merkur in Virgo; Merkuraufgang bis Sonnenaufgang 13°(?), (ideale) LS am x. VI.

26 [VIII nn aben]ds, ES des Merkur in Sagittarius; Sonnenuntergang bis Merkuruntergang 16°(?), (ideale) ES am 12.(?) in Virgo(?)
27 [IX nn abends, LS des Merkur] im Westen in Capricornus, [nicht beobachtet(?)]
28 [nn morgens, ES des Merkur] im Osten in Sagittarius; Merkuraufgang bis Sonnenaufgang [nn°], (ideale) ES am 22.
29 [XI nn morgens, LS des Merkur] im Osten in Aquarius, nicht beobachtet
30 [XII nn abends,] ES des Merkur im Anfang von Aries [. . . .] (ideale) ES am 5.(?)
31 [. . . .] ⌜x⌝ Ellen [. . . .] Venus
32 [nn abends,] Merkur [nn] Ellen unter β Arietis
33 [nn abends, Merkur] 4(?) ½ Ellen [unter] α Arietis; 22, Merkur 2 Ellen über Venus

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34 [Jahr 118, I nn abends,] LS des Merkur im Westen in Taurus, nicht beobachtet
35 II 14 [morgens,] ES des Merkur im Osten, ausgefallen; 27 morgens, LS des Merkur im Osten, ausgefallen
36 III 26 abends, ES des Merkur in Cancer; Sonnenuntergang bis Merkuruntergang 16°, (ideale) ES am 19.(?)
37 [IV nn] abends, Merkur 6 Finger über α Leonis; V 3, LS des Merkur abends in Leo
38 [VI] 3 morgens, ES des Merkur in Leo; er war hell, Merkuraufgang bis Sonnenaufgang 15°, (ideale) ES am 1.
39 [nn mor]gens, LS des Merkur in Virgo, nicht beobachtet
40 VIII 22 abends, ES des Merkur in Sagittarius; Sonnenuntergang bis Merkuruntergang 15°, (ideale) ES am 20.
41 29(?) abends, LS des Merkur im Westen in Sagittarius, nicht beobachtet
42 [IX nn mor]gens, ES des Merkur im Osten in Sagittarius; Wolken, nicht beobachtet
43 X 8, Sonnenwende; 27, LS des Merkur morgens in Capricornus, nicht beobachtet
44 [XII] 1 abends, ES des Merkur im Westen in Pisces; Sonnenuntergang bis Merkuruntergang 15°,
45 (ideale) ES [am] 26.(?) XI.
46 [XII_2 nn abends,] LS des Merkur im Westen in Aries, nicht beobachtet; 11, Äquinoktium
47 [nn morgens,] ES des Merkur im Osten, ausgefallen

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48 [Jahr 119, I nn morgens,] LS [des Merkur] im Osten, ausgefallen
49 [II nn abends,] ES [des Merkur in] Gemini; er war hell, Sonnenuntergang bis Merkuruntergang 15°, (ideale) ES am 17.
50 [nn abends, Merkur] 2 Ellen 10 Finger [unter β] Geminorum
51 [nn abends, Merkur] 1 ⅝ Ellen [über] Jupiter

Kol. ii

1 Jahr 119, II 28 abends, Merkur ⅝ Ellen über δ Cancri
2 III 6 abends, Merkur 4 Ellen unter ε Leonis
3 15 abends, Merkur ⅝ Ellen unter α Leonis
4 29 abends, LS des Merkur im Westen in Leo; Wolken, nicht beobachtet
5 IV 28 morgens, ES des Merkur im Osten im Anfang von Leo; Merkuraufgang bis Sonnenaufgang 16°, (ideale) ES am 24.

6 V 2 morgens, Merkur 4 Finger über α Leonis
7 12(?) morgens, LS des Merkur in Leo; Merkuraufgang bis Sonnenaufgang 13°, (ideale) LS am 16. in Leo
8 VI 16 Äquinoktium
9 VII 21 abends, ES des Merkur in Scorpius; Sonnenuntergang bis Merkuruntergang 15°,
10 [(ideale) ES] am 15. [. . . .]
11 25(?) [abends, LS des Merkur im Westen in . . . .; Wol]ken, nicht [beobachtet]
12 VIII 13 morgens, ES des Merkur [(im Osten) in Scor]pius; er war hell, Merkuraufgang bis Sonnenaufgang 19° 30′,
13 (ideale) ES am 8.
14 15 morgens, Merkur 2 ½ Ellen über α Scorpii
15 27 morgens, Merkur 1 Elle 10 Finger über θ Ophiuchi
16 IX 20 morgens, LS des Merkur im Osten in Sagittarius, nicht beobachtet
17 XI 1 abends, ES [des Merkur] in Pisces; er war hell, Sonnenuntergang bis Merkuruntergang 18°,
18 (ideale) ES am 28. X.im Ende von Aquarius
19 15 abends, LS des Merkur [im Westen] in Pisces, nicht beobachtet
20 XII 22 morgens, ES des Mer[kur in Pisces], nicht beobachtet; an diesem Tag Äquinoktium

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21 Jahr 120, I 10 morgens, LS des Merkur im [Osten(?) in] Aries, nicht beobachtet
22 II 12 abends, ES des Merkur im Westen in Gemini; Sonnenuntergang bis Merkuruntergang 13°, (ideale) ES am 11.
23 23 abends, Merkur 2 ½ Ellen unter β Geminorum
24 III 22 abends, LS des Merkur in Cancer, nicht beobachtet
25 IV 27 morgens, ES des Merkur in Leo; Merkuraufgang bis Sonnenaufgang 16°, (ideale) ES <am> 22.
26 V 10 morgens, LS des Merkur in Leo, nicht beobachtet
27 VII 7 abends, ES des Merkur im Westen, ausgefallen
28 21 abends, LS des Merkur im Westen, ausgefallen
29 VIII 8 morgens, ES des Merkur im Ende von Libra; er war hell, Merkuraufgang bis Sonnenaufgang 20°,
30 (ideale) ES am 2.
31 21 morgens, Merkur 6 Finger über β Scorpii
32 26 morgens, Merkur 3 Ellen über α Scorpii
33 IX 13 morgens, LS des Merkur in Leo(*sic*); Wolken, nicht beobachtet
34 X 22 abends, ES des Merkur in Capricornus; er war hell, Sonnenuntergang bis Merkuruntergang 14°(?), (ideale) ES am 20.
35 XI 11 abends, LS des Merkur in Pisces, nicht beobachtet
36 XII [nn mor]gens, ES des Merkur im Ende von Aquarius; Merkuraufgang bis Sonnenaufgang 14°, (ideale) ES am 4.
37 19 [morgens,] LS des Merkur in Aquarius, nicht beobachtet

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38 Jahr 121, I 3, Äquinoktium
39 II 7 abends, ES des Merkur im [Westen im Ende] von Taurus; Sonnenuntergang bis Merkuruntergang 14° 30′, (ideale) ES am 6.

40 1 + [x] Ellen unter Venus
41 17 abends, Merkur 3 ½ Ellen über γ Geminorum
42 27 abends, Merkur [nn] Ellen unter α Geminorum
43 III 2 abends, Merkur [nn] Ellen unter β Geminorum
44 16 abends, LS des Merkur im Anfang von Cancer, nicht beobachtet
45 IV 17 morgens, ES des Merkur in Cancer, nicht beobachtet
46 V 5 [morgens,] LS des Merkur in Cancer, seit dem 3. trotz Beobachtung nicht gesehen
47 VI 21 abends, ES des Merkur, ausgefallen; VII 5 LS des Merkur [im We]sten, ausgefallen
48 Jahr 121, VII 8, Äquinoktium; VIII 2 morgens, ES des Merkur in Libra; Merkuraufgang bis Sonnenaufgang 15°,
49 (ideale) ES am 28. VII.
50 16 morgens, Merkur 3 Ellen unter β Librae
51 IX 5 morgens, LS des Merkur in Scorpius; seit dem 1. trotz Beobachtung nicht gesehen
52 X 11, Sonnenwende

Kol. iii

1 [Jahr 121, ...]
2 [. . . .] . . . . [. . . .]
3 [. . . .] LS in Pisces [. . . .
4 [. . . .] hinter . . . . [. . . .]

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5 Jahr 122, I [. . . .]
6 13 abends, [Merkur nn Ellen unter β Tauri]
7 15 abends, Mer[kur nn Ellen über ζ Tauri]
8 II 8 abends, [LS des Merkur in Gemini, nicht beobachtet]
9 III 15 morgens, [ES des Merkur in Gemini;] Merkuraufgang bis Sonnenaufgang [nn°], (ideale) [ES] am 10.
10 16, Sonnenwende; 20 morgens, Mer[kur] 5 Ellen unter α [Geminorum]
11 [nn] morgens, LS des Merkur im Anfang von Cancer, nicht beobachtet
12 V 3 abends, ES des Merkur in Virgo; [er war he]ll, Sonnenuntergang bis Merkuruntergang 20°, [. . . .]
13 <<VI>> 18 <abends>, LS des Merkur im Westen in Virgo, nicht beobachtet; VI 19, Äqui[noktium]
14 VI 25 morgens, ES des Merkur in Virgo; Merkuraufgang bis Sonnenaufgang 15° 30′, (ideale) [ES] am 20+[nn]
15 30 morgens, Merkur 1 ½ Ellen über α Virginis
16 VII 10 morgens, Merkur ⅝ Ellen über Mars
17 VII 1 ES des Mars im Anfang von Libra; er war lichtschwach, Marsaufgang bis Sonnenaufgang 14°,
18 2 Ellen über(*sic*) α Virginis, [nn . . . .] über Merkur
19 13, ES des Jupiter in Libra; er war lichtschwach, Jupiteraufgang bis Sonnenaufgang 11°, [(ideale) ES] am 12.
20 3 Ellen über Merkur, 4 Ellen über Mars [hoch] in [Nord]richtung
21 17 <morgens>, Merkur 6 Finger über Jupiter

22 23 morgens, LS des Merkur in Libra; Merkuraufgang bis Sonnenaufgang 11°, [(ideale) LS] am 24.
23 IX 13 abends, ES des Merkur in Scorpius; er war hell, Sonnenuntergang bis Merkuruntergang 15°, (ideale) ES am [nn.]
24 22, Sonnenwende; X 1 abends, LS des Merkur in Aquarius,
25 seit 27.IX. trotz Beobachtung nicht gesehen
26 X 15 morgens, ES des Merkur, 1 Elle hinter β Capricorni (und) 2 Ellen tiefer nach Süden,
27 1 Elle über Venus(*sic*) (und) ½ Elle zurück nach Westen (stehend); Merkuraufgang bis Sonnenaufgang 16°,
28 (ideale) ES des Merkur am 13. im Osten in Capricornus
29 X 20 morgens, Merkur 2 Ellen unter β Capricorni
30 24 morgens, Merkur 2 Ellen unter Saturn
31 XI 14 morgens, LS des Merkur in Aquarius; Merkuraufgang bis Sonnenaufgang 15°, (ideale) LS am 15.
32 XII 25, Äquinoktium

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33 Jahr 123, I 1 abends, ES des Merkur in Taurus; er war hell und hoch, [Sonnenuntergang bis Merkuruntergang] 17°(?),
34 (ideale) ES am 26.XII.
35 I 3 abends, Merkur [nn . . . .] unter η Tauri
36 10 abends, Merkur 4(?) [Ellen] über α Tauri
37 II 1 abends, LS des Merkur im Ende von Taurus
38 III 11 morgens, ES des Merkur in Gemini; er war hell [. . . .]
39 20(?) morgens, LS des Merkur in Gemini [. . . .]
40 IV 23 abends, ES des Merkur in Leo; [Sonnenuntergang bis Merkuruntergang] 15°(?) [. . . .]
41 V 19(?) [abends,] LS des Merkur in Virgo [. . . .]
42 VI 21 morgens, [ES] des Merkur in Virgo [. . . .]
43 VII 11 morgens, LS des Merkur in Libra [. . . .]
44 IX 7 abends, ES des Merkur in Sagittarius [. . . .]
45 20 abends, LS des Merkur in Capricornus [. . . .]
46 X 8 morgens, ES des Merkur im Ende von Sagittarius [. . . .]
47 28(?) morgens, Merkur [nn . . . .] unter β Capricorni
48 XI 17 morgens, LS des Merkur in Aquarius [. . . .]
49 XII 22 abends, [ES] des Merkur in Aries [. . . .]
50 23 abends, Merkur [nn . . . .] unter α Arietis
51 XII_2 6, Äquinoktium; 13 abends, [Merkur nn . . . . unter η Tauri]
52 XII_2 23 abends, [LS] des Merkur in Taurus

Kol. iv

1 Jahr 124, I 28 morgens, Merkur . . . . [. . . .]
2 II ⌜x⌝ morgens, LS des Merkur im Osten, [ausgefallen]

3 III 12 [abends,] ES des Merkur in Cancer; Sonnenuntergang bis Merkuruntergang 25° 30′(*sic*), [. . . .]
4 <IV> 22 abends, LS [des Merkur im] Anfang von Virgo . . . .
5 V 10+[nn morgens,] ES des Merkur in Leo, [Merkuraufgang bis Sonnenaufgang] 15+[nn°]
6 VI 6 morgens, LS des Merkur in Virgo(?); [Merkuraufgang bis Sonnenaufgang] 12° 30′(?) [. . . .]
7 12(?) [. . . .] . . . .
8 [. . . .] (ideale) ES am 2.
9 [VIII nn abends,] LS [des Merkur] in Sagittarius; Sonnenuntergang bis Merkuruntergang 13°, (ideale) LS [am] 18.(?)
10 [nn morgens,] ES [des Merkur in . . . .], Merkuraufgang bis Sonnenaufgang 11°(?),
11 [(ideale) ES] am 10+[nn].
12 [. . . .] 20+[nn . . . .] Merkur [. . . .]
13 X [nn morgens, LS des Merkur in . . . .]
14 XI 10+[nn abends, ES des Merkur in . . . .; Sonnenuntergang bis Merkuruntergang] 15°(?) [. . . .]
15 19 [abends, Merkur] 2 [. . . . unter η] Piscium
16 XII(?) 1(?) [abends, Merkur] 3 [Ellen unter β] Arietis
17 [nn abends, Merkur] 4 Ellen [unter α] Arietis
18 [. . . . seit] dem 11. trotz Beobachtung ni[cht gesehen]

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19 [Jahr 125, I nn morgens, ES des Merkur im Osten,] ausgefallen
20 [II nn morgens, LS des Merkur im Osten, aus]gefallen
21 III 5(?) abends, [ES des Merkur in Cancer . . . .]
22 16 abends, Merkur . . . .
23 2[1(?) abends, Merkur] 1 Finger unter α Leonis
24 [IV nn abends,] LS(?) [des Merkur (im Westen) in] Leo(?), seit dem 12. trotz Beobachtung nicht gesehen
25 [V nn morgens,] ES [des Merkur in Leo], 3 Ellen [hinter(?)] α Leonis; Merkuraufgang bis Sonnenaufgang 15°(?), (ideale) ES am ⌜x⌝.
26 [VI nn morgens,] LS [des Merkur in] Virgo; Merkuraufgang bis Sonnenaufgang 11°(?), (ideale) LS am 2.; 2[2], Äquinoktium
27 VIII [nn aben]ds, ES(?) des Merkur in Scorpius(?); Sonnenuntergang bis Merkuruntergang(?) 16°(?),
28 (ideale) ES am 28. VII.
29 14 abends, LS des Merkur im Westen in Sagittarius, seit dem 12. trotz Beobachtung nicht gesehen
30 25 morgens, ES des Merkur in Scorpius; er war hell, Merkuraufgang bis Sonnenaufgang 18°, (ideale) ES am 24.
31 IX 8 morgens, Merkur 1 ½ Ellen über θ Ophiuchi
32 X 8 morgens, LS des Merkur in Capricornus, nicht beobachtet
33 XI 14 abends, ES des Merkur in Pisces; er war hell, Sonnenuntergang bis Merkuruntergang 16°, (ideale) ES am 11.
34 XII 1 abends, LS des Merkur in Pisces

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35 Jahr 126, I 26 morgens, LS des Merkur im Osten, ausgefallen
36 II 26 abends, ES des Merkur in Gemini; Sonnenuntergang bis Merkuruntergang 12°(?), [. . . .]
37 III 2 abends, Merkur ⅝ Ellen unter α Geminorum
38 5 abends, Merkur 2 Ellen unter β Geminorum
39 14 abends, Merkur 1 Finger(?) unter δ Cancri
40 23 abends, Merkur 4 Ellen unter ε Leonis; 29, Sonnenwende
41 IV 11 abends, LS des Merkur in Cancer, seit dem 8. trotz Beobachtung nicht gesehen
42 V 6 morgens, ES des Merkur im Ende von Cancer; er war hell(?), (ideale) ES am 4.
43 28 morgens, LS des Merkur in Leo; VII 3, Äquinoktium
44 VII 21 abends, ES des Merkur, ausgefallen; VIII 6(?), LS des Merkur im Westen, [ausgefallen]
45 VIII 21 morgens, ES des Merkur in Scorpius; Merkuraufgang bis Sonnenaufgang 14°, [(ideale) ES] am 19.
46 [2]7 morgens, Merkur ½ Elle über β Scorpii
47 IX 5 morgens, Merkur 3 Ellen über α Scorpii
48 X 1 morgens, LS des Merkur in Sagittarius; 6, Sonnenwende
49 XI 8 abends, [ES] des Merkur in Aqua[rius . . . .] . . . .
50 . . . . [. . . .] . . . .

Kol. v

1 Jahr 1[26, ...] . . . . abends, [LS] des Merkur in [. . . .]
2 [. . . . morgens,] ES [des Merkur in . . . .;] Merkuraufgang bis Sonnenaufgang 15°
3 [. . . . morgens, Merkur] ⅝ Ellen unter Mars
4 [. . . .] . . . .
5 XII_2 9, [Äquinoktium; nn morgens,] LS [des Merkur in] Aries, nicht beobachtet

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6 Jahr 12[7, I nn abends, ..., ni]cht beobachtet
7 10+[nn . . . .]
8 II [nn . . . .]
9 [. . . .]
10 III [nn . . . .,] LS [. . . .]
11 [. . . .,] ES [. . . .]
12 [. . . .]
13 VII 14 [. . . .]
14 19 morgens, Merkur [nn] Ellen [über α Librae]
15 25 morgens, Merkur [nn] Ellen [unter β Librae]
16 VIII 4 morgens, [Merkur nn . . . . δ/β Scorpii]
17 [. . . .]
18 IX 2 morgens, LS des Merkur im Anfang von Sagittarius, nicht [beobachtet]
19 X 1 abends, ES des Merkur in Aquarius; Sonnenuntergang bis Merkuruntergang 13° [. . . .]; 1 . . . . [. . . .]
20 24 abends, LS des Merkur im Ende von Aquarius
21 XI 10 morgens, ES des Merkur in Aquarius

22 XII 12 morgens, LS des Merkur in Pisces; 20, [Äquinoktium]

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23 Jahr 128, I 17 abends, ES des Merkur in Taurus [. . . .]
24 20 [abends, Merkur nn . . . .] unter β Tauri
25 23 abends, Merkur [nn . . . .] über ζ Tauri
26 29 [abends, Merkur nn . . . .] über η Geminorum
27 II 1 abends, Merkur [nn . . . .] über μ Geminorum
28 4 abends, Merkur [nn . . . .] über γ Geminorum
29 25 abends, LS des Merkur in Gemini
30 III 26 abends(*sic*), ES des Merkur im Osten in Gemini, nicht beobachtet
31 IV 17 abends(*sic*), LS des Merkur in Cancer, nicht beobachtet
32 VI 1 morgens(*sic*), ES des Merkur im Osten(*sic*), ausgefallen; 11, LS des Merkur im Westen, ausgefallen
33 VII 11 morgens, ES des Merkur in Libra
34 VIII 11 morgens, LS des Merkur in Scorpius; Wolken, nicht beobachtet
35 IX 26 abends, ES des Merkur in Capricornus; Wolken, nicht beobachtet
36 X 17 abends, LS des Merkur in Aquarius; Wolken, nicht beobachtet
37 XI 2 morgens, ES des Merkur in Capricornus, nicht beobachtet
38 XII 12 morgens, LS des Merkur in Pisces, nicht beobachtet

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39 Jahr 129, I 12 abends, ES des Merkur in Taurus; Sonnenuntergang bis Merkuruntergang 14°, (ideale) ES am 11.
40 17, Merkur 2 Ellen unter(*sic*) Jupiter, ½(?) Elle nach Osten vorbei
41 19 abends, Merkur 1+[nn . . . .] über α Tauri
42 28 abends, Merkur 1 Elle 10 Finger unter β Tauri
43 [. . . ., Mer]kur 2 Ellen [über] ζ Tauri
44 [II nn] abends, LS des Merkur in Gemini; Wolken, nicht beobachtet
45 [III] 24 morgens, ES des Merkur im Osten in Gemini, nicht beobachtet
46 [IV nn] morgens, LS des Merkur im Ende von Gemini, nicht beobachtet
47 [V 1]4 abends, ES des Merkur im Anfang von Virgo; er war hell und hoch,
48 Sonnenuntergang bis Merkuruntergang [1]5°, (ideale) ES am 12.
49 [VI nn abends,] LS des Merkur in Virgo [. . . .] (ideale) LS . . . .

Kol. vi

1 [Jahr 129, VII nn morgens, ES des Merkur . . . .;] er war hell und hoch,
2 [Merkuraufgang bis Sonnenaufgang nn°,] (ideale) ES [am nn.]
3 [nn morgens, Merkur] 1 ½ Ellen [über α(?)] Virginis
4 [VIII nn morgens, LS] des Merkur [in Libra;] Merkuraufgang bis Sonnenaufgang [nn°], (ideale) LS am 1.
5 [IX nn ab]ends, [ES] des Merkur [in Capricornus(?);] Sonnenuntergang bis Merkuruntergang [1]3°, (ideale) ES am 23.
6 [X nn abends, LS] des Merkur in [Capricornus,] nicht beobachtet
7 [nn] morgens, [ES] des Merkur [in Capricornus;] Merkuraufgang bis Sonnenaufgang [nn°], (ideale) ES am 24.

8 [. . . .] 1(?) [Elle] vor dem Mond nach Westen zurück
9 XI 9 abends(*sic*), Merkur 2 Ellen unter β Capricorni
10 XII 7 abends(*sic*), [LS] des Merkur in Aquarius, nicht beobachtet
11 XII_2 8 abends, [ES] des Merkur in [. . . .,] nicht beobachtet; 12, Äquinoktium
12 27(?) [. . . .] 10(?) Finger
13 [nn] abends, Merkur [. . . .]

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14 [Jahr 1]30, I 11 abends, [LS] des Merkur [in Taurus, nicht] beobachtet
15 [II] 18 morgens, [ES] des Merkur im Ende von Taurus, [nicht] beobachtet
16 20 abends, [Merkur . . . .]
17 [III . . . .,] (ideale) ES am 29.(?)
18 [V . . . .]
19 [VI] 3 morgens, ES [des Merkur in . . . .]
20 27(?) morgens, [LS] des Merkur im Anfa[ng(?) von . . . .]
21 VIII 9 abends, [ES] des Merkur in Sagittarius [. . . .]
22 IX 6 abends, [LS des Merkur] in [. . . .]
23 [1]7 morgens, [ES] des Merkur [. . . .; 20, Sonnen]wende
24 X 1 morgens, [Merkur . . . .]
25 [. . . .] nicht beobachtet
26 [. . . .] 3 Ellen
27 [. . . .] Ellen

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28 [Jahr 131,] I 1 abends, LS des Merkur im Westen in Taurus; Sonnenuntergang bis Merkuruntergang 17°,
29 (ideale) LS am 4.
30 II 20 morgens, ES des Merkur im Osten, ausgefallen
31 III 21 abends, ES des Merkur in Cancer; (ideale) ES am 19.
32 [IV] 2 abends, <Merkur> 1 Elle über α Leonis
33 [nn] abends, <Merkur> 4 Ellen unter θ Leonis
34 [nn aben]ds, Merkur 1 Elle über Venus
35 [V] 3(?) abends, LS des Merkur in Leo; seit dem 1. trotz Beobachtung nicht gesehen
36 [nn] morgens, ES des Merkur in Leo; Merkuraufgang bis Sonnenaufgang 14° 30′, (ideale) ES am 23.
37 [VI nn morgens,] LS des Merkur in Virgo, nicht beobachtet
38 [. . . .] vom VII. bis XII. Monat nicht aufgeschrieben

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39 [Jahr 132, ... nicht] beobachtet
40 [. . . .] ES [. . . .,] ausgefallen
41 [. . . . LS . . . .,] ausgefallen
42 [. . . . ES . . . .] 15°.

Bemerkungen

i 7: vor "15" ist der Kopf eines senkrechten Keils erhalten.
i 9: vor NA ist der Kopf eines senkrechten Keils erhalten.
i 19: nach *LBAT* 320:4′ ist für nn 16 einzusetzen.
i 21: nach *LBAT* 320:17′ ist für nn 1 einzusetzen.
i 31: vor KÙŠ sind die Köpfe von drei senkrechten Keilen erhalten.

ii 23: auch in *LBAT* 1022:8 erhalten.
ii 37: in *LBAT* 1022 Rs.5′ wird dieses Phänomen für den 30. Tag im Zeichen Pisces angegeben.
ii 39f.: *LBAT* 326:3′ hat: [GU_4 7] GU_4-UD *ina* ŠÚ *ina* TIL MÚL-MÚL 1 KÙŠ *ár dele-bat* ½(?) KÙŠ *ana* SI NIM IGI KUR NIM-[*a*] "[II 7], erste Sichtbarkeit des Merkur im Westen am Ende von Taurus, 1 Elle hinter Venus, ½ Elle hoch gegen Norden; er war hell und hoch." Von dem Zeichen vor KÙŠ in Z.40 ist nur der Kopf eines senkrechten Keiles erhalten.
ii 43f.: zum Teil auch in *LBAT* 326:14′ und 19′ erhalten.
ii 48: der Anfang dieser Zeile ist später eingefügt worden und steht deshalb zum Teil noch in Kolumne i.

iii 5: *LBAT* 1266:5′ hat: BAR 2 GU_4-UD *ina* ŠÚ *ina* MÚL-MÚL I[GI] "I 2, erste Sichtbarkeit des Merkur im Westen in Taurus."
iii 6: das Ende der Zeile ist nach *LBAT* 1266:6′ ergänzt. *LBAT* 1267:14 hat 11 statt 13 als Tageszahl.
iii 7: Anfang erhalten in *LBAT* 1266:6′, Ende in *LBAT* 1267:15.
iii 8: ergänzt nach *LBAT* 1266:8′.
iii 9: ergänzt nach *LBAT* 1265:2′ und 1267:17; dort steht noch KUR NIM-*a* "er war hell und hoch" vor 19 NA-*su*.
iii 10: ergänzt nach *LBAT* 1266:9′.
iii 11: *LBAT* 1265:3′ hat 27 als Tageszahl.
iii 12: *LBAT* 1266:10′ hat NU PAP "nicht beobachtet" nach IGI.
iii 13: vor diesem Datum gibt *LBAT* 1265:4′ 16 13 NA GU_4-UD "am 16., Sonnenuntergang bis Merkuruntergang 13°."
iii 14: teilweise erhalten in *LBAT* 1265:4′.
iii 15: auch in *LBAT* 1266:11′.
iii 17: etwas anders in *LBAT* 530:2-4 (ergänzt nach *LBAT* 1391:3′-5′): AN [*ina* SAG RÍN 2 KÙŠ] *ár* SA_4 1 ⅝(?) KÙŠ *ár* GU_4-UD [*ana* NIM GUB IGI] TUR 14 NA-*su* "[erste Sichtbarkeit] des Mars [im Anfang von Libra, 2 Ellen] hinter α Virginis, 1 ⅝ Ellen hinter Merkur [gegen Osten stehend]; er war lichtschwach; Marsaufgang bis Sonnenaufgang: 14°."
iii 22: ebenso in *LBAT* 1265:5′.
iii 23: anders *LBAT* 1265:6′: GU_4-UD *ina* ŠÚ *ina* MÁŠ 1 KÙŠ *ár dele-bat ana* NIM IGI KUR NI[M] "erste Sichtbarkeit des Merkur im Westen im Steinbock, 1 Elle hinter Venus gegen Osten; er war hell und hoch."
iii 26-28: weitgehend gleich mit *LBAT* 1265:7′f. und 1266:13′; statt des irrigen *dele-bat* steht dort richtig GENNA "Saturn."
iii 29: teilweise erhalten in *LBAT* 1265:8′.
iii 30: in *LBAT* 1265 ausgelassen.

iii 31: *LBAT* 1265:8′: ZÍZ(!) 14 17 NA(!) GU_4-UD *in* 17(?) GU_4-UD *ina* NIM *ina* GU ŠÚ "XI 14, Merkuraufgang bis Sonnenaufgang 17°, (ideale) letzte Sichtbarkeit im Osten, in Aquarius, am 17.(?)."

iii 33f.: ausführlicher in *LBAT* 1265:9′ und 1266:15′: BAR 1 GU_4-UD *ina* ŠÚ *ina* TIL ḪUN 1 ½ KÙŠ *ina* IGI MÚL-MÚL 1 KÙŠ *ina* IGI *sin ana* ŠÚ G[UB IGI KUR NI]M-*a* 17 NA-*su in* 26 *šá* ŠE *ina* LU IGI "I 1, erste Sichtbarkeit des Merkur im Westen, am Ende von Aries, 1 ½ Ellen vor η Tauri, 1 Elle vor dem Mond gegen Westen stehend; [er war hell und ho]ch; Sonnenuntergang bis Merkuruntergang 17°, (ideale) erste Sichtbarkeit am 26. XII., in Aries."

iv 19: ergänzt nach *LBAT* 1269+1270:14′; das Datum dort ist I 25.

iv 20: das Datum II 9 ist in *LBAT* 1269+1270:14′ erhalten.

iv 21: ergänzt nach *LBAT* 1269+1270:15′: [GU_4-UD *ina*] ŠÚ *ina* ALLA IGI KUR 15 NA-*su in* 2 IGI "erste Sichtbarkeit [des Merkur im] Westen in Cancer, er war hell, Sonnenuntergang bis Merkuruntergang 15°, (ideale) erste Sichtbarkeit am 2."

iv 22: *LBAT* 1269+1270:15′ hat: GE_6 16 USAN GU_4-UD SIG SAG A 4 KÙŠ "Nacht des 16., am Abend, war Markur 4 Ellen unter ε Leonis."

iv 23f.: Ergänzungen nach *LBAT* 1269+1270:15′f.

iv 25: *LBAT* 1269+1270:16′f.: IZI 14 GU_4-UD *ina* NIM *ina* A 3 KÙŠ *ár* LUGAL *ana* NIM [GUB IGI KUR N]IM-*a* 18 NA-*su in* 9 IGI "V 14, [erste Sichtbarkeit] des Merkur im Osten in Leo, 3 Ellen hinter α Leonis gegen Osten [stehend; er war hell und] hoch; Merkuraufgang bis Sonnenaufgang 18°, (ideale) erste Sichtbarkeit am 9."

iv 26: Datum VI 1 in *LBAT 1269*+1270:17′.

iv 27f.: vgl. *LBAT* 1269+1270:17′f.: APIN 1 GU_4-[UD *ina* ŠÚ] *ina* GÍR-TAB *ina* IGI *sin* 1 ½ KÙŠ *ana* ŠÚ GUB IGI KUR NIM-*a* 15 NA-*su in* 28 *šá* DU_6 IGI "VIII 1, erste Sichtbarkeit des Merkur [im Westen] in Scorpius, 1 ½ Ellen vor dem Mond gegen Westen stehend; er war hell und hoch; Sonnenuntergang bis Merkuruntergang 15°, (ideale) erste Sichtbarkeit am 28. VII."

iv 30: *LBAT* 1269+1270:19′: 16 NA-*su* "Merkuraufgang bis Sonnenaufgang 16°."

iv 33: *LBAT* 1269+1270:20′f.: ZÍZ 14 GU_4-UD *ina* ŠÚ *ina zib*.ME 2 ½ KÙŠ *ár dele-bat ana* N[IM GUB IGI KU]R NIM-*a* 16 NA-*su in* 12 IGI "XI 14, [erste Sichtbarkeit] des Merkur im Westen in Pisces, 2 ½ Ellen hinter Venus gegen Osten [stehend; er war hell] und hoch; Sonnenuntergang bis Merkuruntergang 16°, (ideale) erste Sichtbarkeit am 12."

v 1: vor *ina* sind die Köpfe von drei senkrechten Keilen zu erkennen.

v 20: die Reste nach dem Trennungszeichen :: gehören noch zu Z. 19.

v 44: nach *LBAT* 340:13 ist als Datum II 23 zu ergänzen.

v 47: *LBAT* 1243:3′: [IZ]I 11 GU_4-UD *ina* ŠÚ *ina* TIL A IGI TUR 15 [NA-*su*] "V 11, erste Sichtbarkeit des Merkur im Westen am Ende von Leo; er war klein, [Sonnenuntergang bis Merkuruntergang] 15°."

vi 1f.: *LBAT* 1243:4′L [DU_6] 7(?) GU_4-UD *ina* NIM *ina* ABSIN IGI TUR 14,50 NA-*su* "[VII] 7, erste Sichtbarkeit des Merkur im Osten in Virgo; er war klein; Merkuraufgang bis Sonnenaufgang 14° 50′."

vi 4: *LBAT* 1243:5′: APIN 3 12,40 NA GU_4-UD *in* 4 GU_4-UD *ina* NIM *ina* RÍN ŠÚ "VIII 3, Merkuraufgang bis Sonnenaufgang 12° 40′; am 4. (ideale) letzte Sichtbarkeit des Merkur im Osten in Libra."

vi 6: Datum X 10 nach *LBAT* 1243:6′.

vi 7: *LBAT* 340 Rs. 16′: [2]7 GU_4-UD *ina* NIM *ina* MÁŠ 1 KÙŠ *ina* IGI *sin ana* ŠÚ <GUB> IGI KUR 16

NA-[*su*] "(X) 27, erste Sichtbarkeit des Merkur im Osten in Capricornus, 1 Elle vor dem Mond gegen Westen <stehend>; er war hell, Merkuraufgang bis Sonnenaufgang 16°."

vi 10: *LBAT* 1243:7′: [2]8 14 NA GU_4-UD *in* 7 GU_4-UD *ina ina* GU [ŠÚ] "(XI) 28, Merkuraufgang bis Sonnenaufgang 14°; am 7. (XII) [(ideale) letzte Sichtbarkeit] des Merkur im Osten in Aquarius."

vi 11: in *LBAT* 1243:8′ ausserdem: GE_6 20 U[SAN] GU_4-UD SIG MÚL-MÚL 14 SI "Nacht des 20. erste Nachtwache, Merkur war 14 Finger unter η Tauri."

The Asakku in Lugal-e

THORKILD JACOBSEN

The Asakku of ancient Mesopotamian lore is an elusive figure. Outside of the epico-mythical composition known as Lugal-e,[1] where it appears as enemy and rival of the hero Ninurta,[2] almost all one can gather from references to it would seem to be that it was a demon who caused some kind of painful disease. Moreover, such distinct individuality as it may have had originally was lost so that its name became a term for a type of demon rather than for any specific one.[3]

Rather different is the picture of the Asakku presented in Lugal-e. There it has no relation to disease, but appears as a powerful warlord in the mountains, who is plotting against Ninurta. Most likely this is the more original conception of Asakku, and the casting of it in the role of demon of disease is a later development prompted by its mythological role as enemy and source of evil.

In Lugal-e the origin and early career of the Asakku is reported to Ninurta in detail by his personified weapon Šár-ùr (lines 26-65). Šár-ùr begins by telling of the birth and early career of the Asakku (or Á-zág, its Sumerian name) as follows (lines 26-36):

1. See the superb edition of J. van Dijk, *LUGAL UD ME-LÂM-bi NIR-GÂL* (Leiden, 1983). In quoting from the composition we give an eclectic text based on the Old Babylonian manuscripts. For the text of individual manuscripts, see van Dijk's edition. The later manuscripts reflecting the Middle Babylonian translation into Akkadian we prefer to disregard. That translation apparently was made from a partly damaged manuscript tradition which it attempted to restore, relying on stereotypes and free conjecture; its grasp of Sumerian is not always secure.

2. As is generally recognized, the original hero of the story was Ningirsu of Girsu, not Ninurta of Nippur (see van Dijk, *LUGAL UD ME-LÂM-bi NIR-GÂL*, pp. 1-4). The two gods were identified anciently, and mythological materials belonging to Ningirsu, such as Lugal-e, were appropriated for Ninurta (compare van Dijk, *LUGAL UD ME-LÂM-bi NIR-GÂL*, pp. 3-4). The essential and original character of Ningirsu was that of a god of thundershowers, of Ninurta that of a god of the plough.

3. See van Dijk's discussion (*LUGAL UD ME-LÂM-bi NIR-GÂL*, pp. 19-30), which leads in many particulars to results different from ours. For the Asakku as a painful disease see *CAD* A/2, pp. 325-26; á-zág gig-ga and the corresponding Akkadian *a-sak-ku marṣu* are best rendered "painful *asakku*-disease" throughout the article. For the debilitating character of the disease, see Falkenstein, *Die neusumerischen Gerichtsurkunden* 2, (Munich, 1956), no. 6, pp. 8-10. For á-zág as a general term, compare the series á-zág gig-ga-meš "the painful *asakku* diseases" CT 17 1f., and also the passages quoted in *CAD* A/2, p. 326 s.v. *asakku* A.a. See also note 17 below for further comment.

lugal-ğu$_{10}$ An-e Ki-sig$_7$-ga ğiš im-ma-dug$_4$
^{d}Nin-urta ur-saĝ ní-nu-zu Á-zág mu-un-ši-ib-dú-ud
dumu-um-me nu-tuš-a ugu$_x$(ÚG) ga gu$_7$-a
lugal-ğu$_{10}$ bùlug a-a nu-zu tun$_x$(KAB)-gaz kur-ra-kam
30. šul ir-ta è-a igi téš nu-ğál-la
^{d}Nin-ğír-su nita ní-íl-íl-i alan-da ḫúl-la
ur-saĝ-ğu$_{10}$ gu$_4$-dam zà-ğu$_{10}$ ga-bí-ib-ús-e
lugal-ğu$_{10}$ lú uru-ni-šè gur-ra ama-ni-šè ak-a
kur-ra šà i-ni-bal numun-bi ba-tál-tál
35. téš-ba mu-bí-ib-sa$_4$ ú lugal-bi-šè
múru-ba am-gal-gim á ba-ni-ib-íl-íl-i[4]

My master, Heaven copulated with the greening earth
Ninurta, she bore him a fearless warrior Asakku
a child not dwelling with the mother, nursed by beasts, a fosterchild, my master,
knowing no father, a killer from the mountains,
30. a shameless youngster, come forth out of the insubordinate,
a towering male, Ninurta, enjoying the stature,
a fighter, my warrior, that I fain would tackle,
a ruler, my master, lenient toward his city, an old hand with his army,
it impregnated the mountains, spread the seeds widely
35. and unanimously the plants named it their king
amidst them, like a great aurochs, it tosses horns.

In attempting to interpret this passage, it will be useful to keep in mind that Lugal-e is a myth—since it deals with the acts of gods—but one cast in epic form, since it deals with heroic action modeled on that of a human hero. The two levels of presentation must be kept apart.

4. Line 26: For sig$_7$ = se$_x$, "green," see Landsberger, *JCS* 21 (1967) 141 n. 14.

Line 28: um-me is um "mother" (*ŠL* 134.2) followed by adessive -e "at," "with." It is balanced by a-a "father" in line 29. We assume that ÚG = *umāmu* had a reading ugu$_x$, since the word means literally "herbivore" and appears elsewhere written etymologically as ú-gu$_7$ (MSL 8/2 42:388), and that ugu$_x$ represents ugu-e with the agentive -e assimilated and contracted as often happens when it follows u.

Line 29: We read KAB as tun$_x$ relying on Poebel's rule (Hallock AS 7, p. 10 note 13) that the simple signs have also the values of composite signs for which they form the basis.

Line 30: See MSL 14 274:15 and 275:4 for ir = *la ma-ga-ri*.

Line 32: For zag-ús "to jostle" see Clay, YOS 1 28 iv 1, tukundi-bi dumu-munus lú zag an-ús níg-šà-ga-ni a im-ru-ru, "If a man jostles the daughter of a man and she aborts her fetus." The context of line 32 suggests purposeful jostling, tackling.

Line 33: The pairing with uru suggests that ama is to be understood as ama-erín-na = *ummanātum*. The complementary concepts are the civil (uru) and the military (ama) sides of government. Against a translation "mother" speaks, of course, the fact that the Asakku was "a child not dwelling with the mother" (line 28), although one may not demand too much consistency of Sumerian poets, particularly since the line probably was a stereotype. This would explain why it uses the personal -(a)ni rather than the expected -bi for the nonpersonal Asakku.

Line 34: The translation of šà-bal as "impregnated" is conjectural. Some such meaning seems indicated by the context and by a possible etymology of šà-bal as "to flood (*raḫāṣu*) the womb."

Line 35: A single manuscript, I, reads ^{na_4}šam(Ú) rather than ú, probably because the scribe thought it referred to the Asakku and remembered that it was made into a stone. However, such a reading leaves the sentence without an active subject; the stone into which the Asakku was turned was not the ^{na_4}šam but the ^{na_4}zalag, and the section dealing with the ^{na_4}šam later in the composition presents the ^{na_4}šam as live whereas the Asakku at that point had been killed. The reading must thus be considered erroneous.

On the epic level the Asakku is seen as an exposed child that survives because it is suckled by wild animals.[5] As it grows up it becomes a fighter and the head of a city state, and eventually it is chosen king. On the mythological level it is a being engendered by Heaven impregnating Earth, as are grass, herbs, and the shrubs that grow up after the spring rains.[6] It would thus seem likely that the Asakku was a plant; this agrees well with the fact that throughout this section it is treated as nonpersonal, an "it," and that it became king of the plants. Its towering size (line 31, compare 36) suggests a tree and so does the fact that it has seeds that it scatters over the mountains.

The next following sections, lines 37-168, describe in the epic mode how the Asakku's warriors, certain stones, raid the cities and how the cities bow down to it and bring it tribute; like Ninurta, it judges in its sphere of influence and makes highhanded changes. It seeks intelligence about Enlil and Ninurta, learns that Ninurta is the only warrior around, and plots to destroy him and take over his kingship and sacred offices.

At the end of its report Šár-ùr underlines how formidable an opponent the Asakku is, more so than any Ninurta has met before. In the description of the Asakku here the epic mode yields briefly to the mythological one in the characterization. Lines 60-64 read:

60. Á-zág zi-ga-bi šu la-ba-ğál dugud-da-bi im-gu-ul
ugnim-bi-ta inim íb-ta-túm erín-bé igi la-ba-te-ğá
ur$_5$-ra esi-ga-bi saĝ im-gi$_4$ ^{giš}tukul-e ğiš la-ba-ab-KIN
^{d}Nin-urta šen šita šukur-maḫ-e su-bi nu-dar-re
ur-saĝ na-me-gim na-ra-gim.

The Asakku's attack no hand can stay, it is very heavy,
reports are brought in about[7] its host, but no spying eye gets near its troops,
the hardness of that one is impenetrable, no weapon can pierce(?)[8] the wood.
Ninurta, neither axe, mace nor great spear will cleave its body,
Warrior, you may not find it like unto anything else.

As will be seen, the description here given confirms the earlier indications that the Asakku was visualized as a tree; its body is hard wood.

Hearing Šár-ùr's report, Ninurta decides on a preventive strike, gathers his forces, and sails off to raid the mountains. Šár-ùr, after a reconnaissance flight, returns to warn Ninurta against attacking the Asakku itself: it is too strong. Ninurta, however, disregards its advice and rashly engages the enemy. The battle that follows, dominated by the Asakku's fearsome charge, is told in lines 168-81:

Á-zág mè saĝ-ba mu-un-zi
an nam-^{giš}tukul-šè úr-ba mi-ni-in-bu šu im-ma-ab-ti
170. muš-gim saĝ ki-a im-mi-íb-bé
ur-[idim] lú-erím-šè kun-sù dìm-ma ug$_5$-ge-en
a da-bi-a mu-un-sur-sur-re
Á-zág ^{d}Nin-urta dumu ^{d}En-líl-lá-ra é-gar$_8$(LUM) mu-un-[na-]gul-lu
ud nam-tag-ga-gim gù-ḫuš bí-íb-ra

5. Very similarly Ningirsu is said to have been Ḫur-saĝ-e dú-da máš-lu-lim-e ga zi gu$_7$-a, "borne by the foothills, suckled with the right milk by does" Gudea Cyl. Fragm. 5 ii 4-5. A more remote parallel is, of course, provided by Romulus and Remus.

6. Compare the incantation ZA 32 (1920) 174:58, *kima šamû irḫû erṣeti* (var. *erṣetum*) *im$^{?}$idu šammû*.

7. Literally "from."

8. A guess from the context and from the meaning "pointed," "acuform" (*zaqtu*) of KIN-a; cf. *zaqātu* "to sting."

175. muš-sağ-kal-gim un-ba sig_x (KA×BALAG) bí-ib-gi_4
kur-ra a mi-ni-ib-laḫ ^{giš}šinig mi-ni-íb-ùr
ki-a su bí-íb-dar GIG-ma bí-íb-ğar
ğiš-gi izi ba-ab-sum an-e úš bí-íb-tu_5
šà-ge ti bí-íb-bal un-bé sağ ba-ab-dug_4
180. i-ne-eš u_4-da a-šà-ga ùḫ-gi_6
me-da ur-an-na ḫé-me-da-gim zu-a-šè ur_5 ḫé-en-na-nam-ma-àm

The Asakku rose (to attack) in the front line of battle
heaven it pulled down to its hip for a weapon, took it in hand,
170. dripped like a snake venom(?) on the earth,
the frenzied dogs wagging the tails at the enemy: "Have you killed a victim?"
were drooling slaver on to their forepaws.
The Asakku was going to crush like a (falling) wall Ninurta, Enlil's son,
as were it a day of doom, it wrathfully screamed,
175. and like a redoubtable serpent it hissed amidst its people.
In the highland it dried up the waters and swept away the tamarisks,
it gashed the body for Earth, made painful wounds
the canebrake it delivered up to fire, and bathed the sky in blood,
made the interior[9] keel over, scattered its people
180. and until now, today, black cinders are in the fields
and ever heaven's base becomes to the observer like red wool—thus verily it is.

The picture of the Asakku that the text draws here is in the mythological mode, yet very clearly different from what has gone before. The Asakku is no tree, but the duststorm personified. The sense of the sky closing down upon one when such a storm begins underlies the line about the Asakku drawing down the sky to its hip to use as a side-arm (169). The eerie reddish light during a duststorm colored in this case the horizon permanently red morning and evening (181). The dry wind of the duststorm is behind the Asakku's drying up the waters in the highland (176; compare 216, 274, and 277), and the wounds made in Earth's body are the gullies which the strong wind of the duststorm erodes in the surface of the ground. Correspondingly the means by which Ninurta gains the upper hand in the battle is a thunderstorm that lays the dust (229 and 253) so that Ninurta can breathe freely (217).

That Ninurta was able to overcome the Asakku was due to Enlil, to whom Šár-ùr had flown for help, and who provided the deciding thundershower. After Ninurta had won the battle, he was inclined to cease his efforts, but Šár-ùr upbraided him, urging him to destroy the Asakku itself, otherwise he would never be safe. Ningirsu followed the advice and engaged the Asakku in single combat. The text describes it as follows (288-306):

^{d}Nin-urta erím-e mu-ni-in-dib AB-GAR-gim mu-un-sè
Á-zág ní-me-lám-bé gub-ba sig-šè ba-ši-ğen
290. sig-šè ba-ši-ğen nim-šè u_6 bé-in-dug_4
<nim-šè ba-ši-ğen sig-šè u_6 bé-in-dug_4>
a-gim mu-un-lù-lù kur-ra ság bí-in-dug_4
ú-gug_4-gim mu-un-bu ú-númun-gim mu-un-zé
ní me-lám-ma-ni kalam-ma dul-[lu]
Á-zág še-$šeg_6$-ğá-gim mu-un-dúb numun-bi im-da-an-di

9. Presumably the interior regions of the marshes.

295. sig_4-si-il-lá-gim téš-ba bí-in-ğar
šu-gal-an-zu-bi ne-mur-ra-gim-nam zì-dè-eš mu-un-dub-⌜dub⌝
im-dù-a im-bi suḫ-a-gim téš-bi im-mi-in-ğar
ur-sağ-e níğ-šà-ga-na mu-un-sá
^{d}Nin-urta en dumu-^{d}En-líl-lá ì-sig_6 ba-$šed_x$ (MÙŠ-DI)-[dè]
300. kur-ra ud-ta im-ma-ra-[è]
^{d}Utu silim-ma mu-na-an-[dug_4]
en-e íb-lá ^{giš}tukul a m[u-un-tu_6] mita (TUKUL+MID) a mu-un-tu_6
ur-sağ-e sağ-ki šu bí-íb-ùr adda(LÚ ÚŠ) za-pa-áğ bí-in-ğar
AB-GAR-gim Á-zág-ug_5-ge-na má-ga_2 aka-da-ni
305. ğ[uruš kala]m-ma mu-un-na-su_8-ge-eš
du_{24}-ùr-kúš-a-gim mu-un-na-gurud-dè-eš

Ninurta passed through the enemies, laid them out as were they fatted calves(?)[10]
to the Asakku waiting in its dreadful glory
290. he strode southwards, looked (back) northwards
strode northwards, looked (back) southwards,[11]
roiled it as one would water,[12] scattered it over the mountain,
tore it out like rushes, plucked it out like sedge,
his (own) dreadful glory covering the country
like ripe grain he shook the Asakku, made its seed(-cones) drop off it
295. piled them up together like broken bits of mudbrick
its capable "hands" as were they but ashes he strewed like flour
like extracted clay from a terre-pisé wall he piled them together.
The warrior had accomplished what he had at heart
the lord Ninurta, Enlil's son, relaxed(?),[13] calmed down,
300. came out of the storm in the mountains,
and hailed the sun.
The lord rinsed belt and weapons in water, rinsed the *miṭṭu* weapon in water;
the warrior wiped (his) brow and sounded the victory cry over the corpse.
And as he carved up the Asakku, which he had killed, like a fatted calf(?)
305. the lads of the country came up to him
and fell down before him like tired donkey (steeds).

With this description we are clearly back to the concept of the Asakku as a tree. It can be uprooted like rushes and sedge, it has seeds that can be shaken off, apparently brown pine cones which can be compared to fragments of buff mudbrick, and "hands"—apparently the pine twigs

10. AB-GAR here and in line 304 apparently refers to something butchered *en masse* and then cut up. The translation "fatted calf" is conjectural only.

11. Compare Gudea Cyl. A xvii 22-27 where Gudea paces off the building plot for his new Eninnu: É-ninnu-^{d}Anzud ^{mušen}babbar$_x$(UD-UD)-šè Gù-dé-a sig-ta ba-ši-ğen nim-šè u_6 bí-dug_4 nim-ta ba-ši-ğen sig-šè u_6 bí-dug_4 iku zi-dam éš ì-ğar-ğar á-ba ğiš bí-ğar ní-te-ni mu-zu, "Toward Eninnu-Anzud-babbar Gudea walked from the south, looked northward at it, walked toward it from the north, looked southward at it, laid the measuring line on a true acre, placed pegs at its sides, checked them himself." Comparison with this explicit Gudea passage suggests that the text of Lugal-e as we have it is corrupt and would originally have read the same as Cyl. A. We have thus restored it and assume that it refers to the way a woodsman will pace off the length of a tree in the direction it is to fall, before he begins to fell it, to make sure it falls free.

12. The sense of the metaphor would seem to be something like "he mussed it up"; lù is translated both as *dalāḫu* "to roil" and as *balālu* "to mix" in Akkadian.

13. Compare von Soden, *AHw* 2 840 for sig_6 = *pašāḫu*.

at the end of the branches with their needles—which could be "strewn" and "piled." The complete passivity of the Asakku when Ninurta walks up to it is also easier to understand if it is a tree. Underlying the general description of the battle is, it would seem, the image of a heavy storm—Ninurta as thunderstorm—shaking and uprooting a large tree.

The killing of the Asakku is not the last we hear about it. In lines 324-30 we are told further that:

Á-zág ki-bala-a ú-g[ug-gim bu-ra ú-númun-gim zé-a]
325. ⌜en⌝ ^{d}Nin-urta-ke$_4$ ^{giš}mitta(TUKUL+⌜MID⌝)-⌜ni⌝ [ub-a bí-in-gub]
⌜zag⌝-⌜nu⌝-di-gim aš-gim gub-bu ul-la al(?) [bé-di]
[u$_4$]-da(?)-ta Á-zág nam-ba-di na$_4$ mu-bi ḫé-[em]
na$_4$ ^{na_4}zalag mu-bi ḫé-em na$_4$ mu-bi ḫé-em
ur$_5$-ra-àm bar-bi zé ḫé-em
330. nam-ur-saĝ-bi ⌜en⌝-ra ḫé-em.

With the Asakku plucked from the rebel regions like witchgrass, weeded out like sedge
the lord Ninurta stood his *miṭṭu* weapon in the corner,
as one unrivaled, as the only one, he full of gratification demanded
"From this day on may 'Asakku' not be said, may 'stone' be its name!
May 'stone', 'zalag stone,' be its name, may 'stone' be its name!
May thus its extinction[14] be bitter
330. and may its office of warrior be for the lord."

The Asakku's punishment is to be deprived of posthumous fame, to lose identity, to be spoken of henceforward as if it had been merely some stone of little consequence, and to lose its great name—an extinction that line 329 rightly terms "bitter," thinking, apparently, of the Asakku's shade in the Netherworld.

Having thus considered the main passages in Lugal-e that have bearing on the way it envisages the Asakku, we may attempt to sum up. As mentioned above, Lugal-e is a myth, or rather a compilation of myths, since the acting persons are not humans but gods. However, the mythical materials are presented by the poet in the epic mode, modeled upon epics telling of the deeds of great human warriors. In the case of the Asakku, the sequence of images that picture it as a foundling nurtured by wild beasts, adopted (the text does not say by whom), and rising as leader of a band of brigands to a position of powerful warlord and as such plotting to supplant Ninurta with disastrous results, are all features implicit in the personifying and heroicizing of the epic mode.

In the underlying mythic materials the Asakku appears basically as a tree. There are references to its height (31), its wood (62), and its seeds or cones (294) which it spreads widely over the mountains, thus apparently engendering their pine covers. It was borne by the soil, "fertilized" by the rains from the sky, and became king of the plants. All of this indicates a plant, specifically a tree growing in the high mountains, most likely a pine.

The one exception is the passage describing the Asakku's role in the battle against Ninurta, in which it almost conquered him. Here the poet uses a different image, that of a duststorm which chokes Ninurta and from which Ninurta is saved by following Enlil's advice to loosen a thunderstorm, the rain of which will lay the dust and allow him to breathe freely.

The obvious inconsistency of this sudden change of image should not surprise us since the Sumerian poets apparently enjoyed a *licentia poetica* far greater than any modern writer would

14. For bar = *balû* "non-being" see MSL 16 223:283.

dare claim; thus the poet will have felt free to alter his image of the Asakku at will to fit a given situation.[15] In the description of the battle a tree would be far too stationary to represent the fury and motion of the leader of an attacking force in a violent battle, and so a standard image for a pitched battle, the duststorm, was made to serve instead. The unsuitability of the tree image to render activity is obvious later on in the account of the single combat with Ninurta. The Asakku is entirely passive and just stands there, but since it is the victim and Ninurta, envisaged as a storm, provides the violence demanded of this climactic scene, there was here less need to change.

The fact that after Asakku's death its name was changed to that of a stone does not, of course, speak against the tree form; rather, it is a deliberate punitive measure designed to destroy that very form.

One may reasonably assume, therefore, that the author of Lugal-e envisaged the Asakku as a tree, most likely as a tall pine indigenous to the mountains.

A few questions remain. Since it is difficult to see how a tree could meaningfully be considered a dangerous rival of a god of thundershowers, one may legitimately ask whether this motif was an original and genuine part of the standard Ninurta/Ningirsu mythology or rather a new addition, and, if the latter, from where it would have come.

The standard list of foes vanquished by Ninurta/Ningirsu, given by Gudea in Cylinder A xxv 24 - xxvi 19, does not mention the Asakku. If, as asserted in Lugal-e, the victory over the Asakku had been more difficult, and so more glorious, than any previously attained by Ninurta, it would be inconceivable that Gudea would have passed it over without mention had he known of it. Most likely, therefore, it *is* a later addition made to the story by the author of Lugal-e.

Asking further about where the motif may have come from, one must turn from mythological to epic lore—a field with which the author of Lugal-e was clearly acquainted. A standard theme in epics is one in which the hero, to prove himself and establish a name for himself, goes to fell trees in far-away mountains. This is how Gilgamesh intended to gain fame in the story of Gilgamesh and Ḫuwawa, and rulers tell of similar feats with pride in their inscriptions. To name just a few, Gudea tells of procuring cedars from the Amanus for his temple building; and Yaḫdun-Lim of Mari, much like Gilgamesh, establishes a name for himself by felling trees in the mountains.[16] Thus the motif of hero versus tree lay to hand; it was necessary only to replace the human hero with Ninurta and to personify the tree on the model of a mountain brigand.

Lastly one may ask about the name of the Asakku, Sumerian Á-zág. What may it be assumed to mean and how does that meaning relate to the Asakku's role in the composition? Unfortunately any attempt to answer can be no more than conjecture; possibilities, not certainties, are all one can aim for. Considering with this proviso the use of the Sumerian term Azag from which Akkadian Asakku was borrowed, one notes that outside of Lugal-e the term is used to denote things sacred and therefore taboo; it also designates a demon personifying a disease, presumably one that made the affected person unclean, and therefore also taboo. The term thus covers the full range of untouchableness from the sacred to the polluting.[17] What might have prompted the

15. Note, e.g., that in the section on the *ḫulālu* stone Ninurta is not the beloved son of Enlil and Ninlil but describes himself as exposed as a child and picked up at the city wall and adopted by the Ḫulālu. In the first part of the Dilmun myth Nin-sikil-la is daughter and wife of Enki, later as Nintur she is virginal and wooed by Enki. In the first part of the myth of Enki and Ninmaḫ, Ninmaḫ is merely a midwife helping at the birth of man; in the second half she is the great birth goddess forming the embryo in the womb etc.

16. *Syria* 32 (1955) 1-17, note to ii 20.

17. It seems likely that uzug, which has much the same range, from "sacred area" (*ašīrtu*) to "defiling," "taboo" (*mussuku*), is to be considered a phonetic variant. Groups like ama:eme:umu "mother," aman (in Amanki = Enki):ên (contracted from emen):umun (Emesal) "lord," arad:ere(d) (Emesal):urdu "slave," uru:eri "city," nagga:niggi "tin," gurùn:girin "flower," samag:sumug "wart," madal:mudul "salted beef," balaĝ:buluĝ "harp," etc., are frequent.

author of Lugal-e to choose this term to designate his anti-hero? It is unlikely that he would have had the disease or the demon representing it in mind, for the Asakku of his composition causes no disease anywhere to anybody. Nor is the other extreme, sacredness, a very likely pattern, for the author depicts the Asakku as nonpersonal and in no sense divine or sacred. It is in the middle ground between the two extremes—that of the neutral "untouchable," "forbidding," or "repelling approach"—that he looked; the image of the Asakku is indeed characterized by just such forbidding, unnerving presence. In lines 43-45 Šár-ùr says of it:

Á-zág me-lám-ba a-ba šu mi-ni-íb-ku$_4$-ku$_4$
saĝ-ki-gal-gal-bi a-ba íb-ta-ĝá-ĝá
zu im-sìg né su-e bí-íb-ús.

Who could put the hand into the Asakku's dread glory?
Who could remove it (i.e. the glory) from its great temples?
It makes kith tremble, brings terror to kin!

Similarly, as it stands awaiting Ninurta's final attack (289), its dread glory (me-lám) is apparently its only defense.

A characterization as untouchable, forbidding, would fit a bandit chief from the mountains well; it would be peculiarly apt when applied to a mighty tree by the Sumerians, who, living on the largely treeless south-Mesopotamian plain, stood in awe of tall trees. In the story of Gilgamesh and Ḫuwawa, from which the author of Lugal-e may have obtained the motif of "hero against tree," Gilgamesh, when he first catches sight of Ḫuwawa, becomes completely paralyzed with fright of the seven "terrors" in which Ḫuwawa is clad, and cannot move. These "terrors," we learn a few lines later on, are cedars or stands of cedars, so the concept of the daunting tree is germane to the epic tradition to which the motif belongs.

Two Tables from an Arabic Astronomical Handbook

for the Mongol Viceroy of Tibet

E.S. KENNEDY AND JAN HOGENDIJK

This study has no direct connection with Abe Sachs or Assyriology other than the all-pervasive sexagesimal numbers it employs. Nevertheless it is dedicated to the memory of a colleague whose trenchant wit only thinly covered his essential modesty and kindliness. We never think of him but with affection and admiration.

INTRODUCTION

In December of 1366 a certain Abū Muḥammad ʿAṭā b. Aḥmad b. Muḥammad Khwāja Ghāzī al-Sanjufīnī completed a *zīj*, a set of astronomical tables, preserved in the unique Paris manuscript BN Arabe 6040. He dedicated it to his patron, Prince Radna, the Mongol viceroy of Tibet, and a direct descendant in the seventh generation from Genghis Khan. The viceregal capital is named in the *zīj*, and Professor Herbert Franke has identified it as the then Ho-chou, in the Chinese province of Kansu, southwest of the modern provincial capital, Lan-chou. As for the author, his name indicates that he or his ancestors came from a village near Samarqand, in Central Asia.

The manuscript is of considerable interest, containing among its forty-two tables information on calendars, lists of fixed stars with their Chinese names written in Arabic characters, numerous Mongol and a few Tibetan glosses, and the usual spherical astronomical and planetary material. From amid the plethora of intriguing questions raised by this curious document, two have been chosen for investigation below.

Among the tables used for eclipse predictions is one based ultimately upon theories originating in India in the seventh century or before. The calculation of the entries by a method which is as elegant mathematically as it is absurd astronomically is described in a document from ninth

century Baghdad. A version of this parallax table turned up in a *zīj* written in Damascus in the fourteenth century. But the Sanjufīnī version is included in a *zīj* from the Caucasus dated two centuries before. Thus, in the course of seven hundred years the theory migrated westward to Europe, thence back eastward, reappearing not far from its place of origin.

The second table enables its user to predict the appearance of the new moon, thus determining, for instance, the end of the Muslim fasting month. There is an enormous literature on the subject, but Sanjufīnī's method appears to be more or less independent, marginally related to that of Thābit ibn Qurra.

The table gives explicitly a terrestrial latitude of 38;10°, a parameter which is shown below to be embedded in the table itself. The same number appears five times elsewhere in the *zīj*. Now the latitude of Lan-chou is 35;44°, which differs from the above by about two and a half degrees. A second Mongol provincial capital, Yung-ch'ang fu, is also mentioned in the *zīj*. Its latitude is very close to 38;10°. Considerations connected with an eclipse prediction in the *zīj* make it very probable that the second city was the base locality for which the tables were computed.

THE PARALLAX TABLE

This takes up the entirety of f. 42v. It is called "A Table of the Equation of Distance for the Middle of the Eclipse" (*Jadwal taʿdīl al-buʿd li wasaṭ al-kusūf*). A Mongol gloss runs along the right hand side of the page. According to Professor Herbert Franke,[1] this consists of four words, the first two being the usual Mongolian for a lunar eclipse. The last two are Arabic *taʿdīl* and (probably) *buʿd*, transliterated into Mongolian characters. The scribe was evidently astronomically uninformed, for *kusūf* usually denotes a solar eclipse, and this particular table can be used only for solar eclipses.

The page on which it appears has been divided into four main columns, each of which is further split into two subcolumns. The right hand subcolumns are headed "(time) between conjunction and noon," and contain the values of the argument, in hours and minutes: 0;3, 0;6, 0;9, . . . 6;0. The subcolumns on the left are headed "(time) between the eclipse middle and noon." The entries underneath are to seconds of time.

The same table, except for a few differences due to scribal errors, appears as Table L in Part 2, p. 174 of a Byzantine Greek version[2] of *zīj* written by one ʿAbd al-Karīm al-Fahhād al-Shirwānī c. 1175. There it is called in Arabic *Taʿdīl sāʿāt al-ruʾya*, "The Equation of the Hours of Visibility." Every fourth entry has been transcribed and appears as Columns 1 and 3 of our Table 1 below. An application of the table is cited by Neugebauer.[3]

1. H. Franke, "Mittelmongolische Glossen in einer arabischen astronomischen Handschrift von 1366," to appear in *Oriens*.

2. D. Pingree, *The Astronomical Works of Gregory Chioniades*, Vol. 1, The *zīj al-ʿAlāʾī*, 2 parts (Amsterdam, 1986).

3. O. Neugebauer, *The Astronomical Tables of al-Khwārizmī*, Translation with Commentaries . . . (Copenhagen, 1962), p. 28.

TABLE 1

1	2	3	4	5	6
t		*T*	*P* in hours		
hours	degrees	Sanjufīnī-Shirwānī entries hours	Sanjufīnī = *T* - *t*	Computed, ε = 23;51	Khwārizmī
0;12	3	0;20,53	0; 8,53	0; 8,32	0; 8,38
0;24	6	0;41,24	0;17,24	0;16,58	0;17, 7
0;36	9	1; 1, 5	0;25, 5	0;25, 9	0;25,23
0;48	12	1;20,28	0;32,28	0;33, 2	0;33,23
1; 0	15	1;40, 0	0;40, 0	0;40,31	0;40,54
1;12	18	1;58,29	0;46,35	0;47,32	0;48, 0
1;24	21	2;16, 0	0;53, 0	0;54, 3	0;54,53
1;36	24	2;36,35	1; 0,36	1; 0, 3	1; 0,25
1;48	27	2;54,24	1; 6,24	1; 5,31	1; 6,12
2; 0	30	3;11,20	1;11,20	1;10,28	1;11, 5
2;12	33	3;27,36	1;15,36	1;14,54	1;15,27
2;24	36	3;43,28	1;19,28	1;18,49	1;19,32
2;36	39	3;59,13	1;23,18	1;22,15	1;22,56
2;48	42	4;14,15	1;26,15	1;25,14	1;25,49
3; 0	45	4;29,20	1;29,20	1;27,47	1;28,24
3;12	48	4;43,[4]	1;31, 4	1;29,55	1;30,33
3;24	51	4;56,37	1;32,37	1;31,40	1;32,16
3;36	54	5; 9,[4]	1;33, 4	1;33, 3	1;33,41
3;48	57	5;21,52	1;33,52	1;34, 6	1;34,44
4; 0	60	5;34,50	1;34,50	1;34,50	1;35,27
4;12	63	5;47, 6	1;35, 5	1;35,15	1;35,51
4;24	66	5;59,14	1;35,12	1;35,24	1;36, 0
4;36	69	6;11,13	1;35,13	1;35,17	1;35,51
4;48	72	6;23,24	1;35,24	1;34,55	1;35,29
5; 0	75	6;35,30	1;35,30	1;34,20	1;35,53
5;12	78	6;46,10	1;34,10	1;33,32	1;34, 4
5;24	81	6;56,32	1;32,32	1;32,32	1;33, 1
5;36	84	7;6,[5]5	1;30,55	1;31,22	1;31,49
5;48	87	7;17, 0	1;29, 0	1;30, 2	1;30,27
6; 0	90	7;27, 0	1;27, 0	1;28,34	1;28,51

It can be inferred from Sanjufīnī's explanatory text (f. 13v:6) that the function is intended to supply a time for a luni-solar apparent conjunction, corrected for the effect of parallax in longitude. the term *taʿdīl* (equation, correction) appearing in both titles is a misnomer, for the function *T*, the time from noon of the apparent conjunction, appearing in Column 3 has already

had the correction added to it. If t denote the hour angle or time of the true conjunction, the argument in Column 1, then:

$$T - t = P$$

is the correction due to parallax. This function has been plotted as the dotted curve on the graph below, where each dot corresponds to a value of P obtained from the sources. It is clear that whoever calculated the table in the first place did a bad job. The curve is never smooth, and several segments give the impression of having been determined by linear interpolation between fixed points. The plot is practically flat on top. Moreover, whatever theory underlies the computation, it corresponds only crudely to the facts. The function starts from the origin, and it is true that the longitude component of parallax is zero or near it at noon, being larger in the forenoon and afternoon with increased zenith distance. But the P function has a maxiumum at about $t = 4;24^h$, frequently well before sunset.

A very similar function is displayed in Table 77 of Suter's *Die astronomischen Tafeln des Muḥammed ibn Mūsā al-Khwārizmī* (Copenhagen, 1914), the Latin translation of the Majrīṭī recension of the *zīj* of al-Khwārizmī (fl. 830), and a second copy is in the *zīj* of Ibn al-Shāṭir[4] (fl. 1350). Entries excerpted from it are shown in Column 6 of our table, and they have been plotted as the continuous curve on the graph. In contrast to the other, they have been calculated with precision. Different but equivalent units are used for the arguments (Column 2), time degrees of daily rotation, whereby fifteen degrees correspond to one hour. Also the Khwārizmī table is more realistic than the Sanjufīnī-Shirwānī version as to daylight length, the argument going to 150° (= 10 hours). Perhaps the more crude table was intended for "unequal hours", defined as a sixth of the time from sunrise to noon. The text says nothing to this effect, but it is specified by Ḥabash,[5] mentioned just below.

The method of calculating the Khwārizmī table is explained in the *zīj* of Ḥabash al-Ḥāsib (fl. 830).[6] In the recursion relation

$$T_n(t) = t + \varepsilon \sin T_{n-1}(t)$$

where ε is the obliquity of the ecliptic, put $T_0 = t$ and calculate successive elements of the convergent sequence $T_1, T_2, T_3, \ldots \rightarrow T(t)$ until the desired degree of precision has been attained.[7] Ḥabash regarded T_5 as sufficient.

The result satisfies the expression

(1) $$T(t) = t + \varepsilon \sin T(t)$$

known as Kepler's equation. Then

(2) $$P(t) = 0;4\ \varepsilon \sin T(t)$$

is the desired P for any given t.

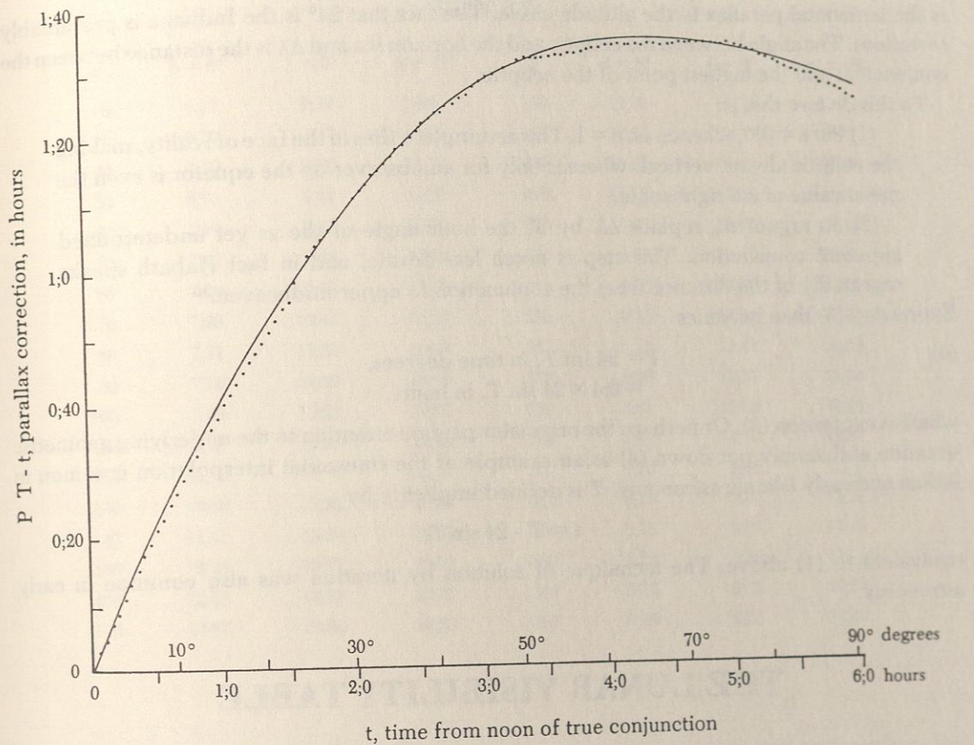
The Khwārizmī version of the Table has been calculated with $\varepsilon = 24°$, the standard Indian value, and the method seems to be of Indian origin. But the differences between the two tables suggest that there is a different parameter embedded in the Sanjufīnī version. In order to examine this possibility, a Hewlett-Packard 67 calculator was programmed to compute values of P, the machine pinching off the iteration process when the difference between successive approxima-

4. Bodleian MS Seld. Arch. A30.

5. Ḥabash, *Al-Zīj al-Maʿrūf bi'-Dimashqī* (Istanbul, MS Yeni Cami 784), f. 212b.

6. Ḥabash, *Al-Zīj al-Maʿrūf bi'-Dimashqī*, ff. 210a-213a; see also Kennedy, "Parallax Theory in Islamic Astronomy," *Isis* 47 (1956) 51, and Kenndy, "Spherical Astronomy in Zīj," *Zeitschrift für Geschichte der arabisch-islamischen Wissenschaften* 2 (1985) 125.

7. Cf. Kennedy and Transue, "A Medieval Iterative Algorism," *American Mathematical Monthly* 63 (1956) 80-83.



tions became less than 0.0002. Calculations were made for the set of t's shown on Table 1, for three values of ε:(1) 24°, (2) 23;35°, a common medieval value which is implicit in at least one table of the Sanjufīnī *zīj* (f. 40r), and (3) 23;51°, a Ptolemaic value used along with 24° by Khwārizmī.[8] The results of calculation using the third value are shown in Column 5 or Table 1, adjoining Sanjufīnī's values in the preceding column. The latter are so badly done that, of the total of thirty excerpted, twelve are near none of the three recomputations. Of the remainder, five are close to (1), three to (2) and nine to (3), two of them to within a second of time. It seems probable that Ptolemy's ε, which reappears in the section below, underlies the Sanjufīnī table.

By way of conclusion, a conjecture as to the rationale of the scheme is presented. The associated parts of the Khwārizmī and Ḥabash *zīj*es are firmly embedded in the Indian astronomical tradition. Professor O. Neugebauer has shown[9] that in the Indian theory the parallax in longitude is given by the expression

(3) $$P = P_0 \sin a \sin \Delta\lambda,$$

where

$$P_0 = \begin{cases} 0;4 \text{ days, or} \\ 0;4 \times 360 = 24° \text{ of daily rotation, or} \\ 24/15 = 0;4 \times 24 = 1;36 \text{ hours} \end{cases}$$

8. Neugebauer, *Tables*, p. 96.

9. Neugebauer, *Tables*, p. 123.

is the horizontal parallax in the altitude circle. The fact that 24° is the Indian ε is presumably fortuitous. The angle between the ecliptic and the horizon is a and $\Delta\lambda$ is the distance between the conjunction and the highest point of the ecliptic.

To this do two things:

(1) Put a = 90°, whence sin a = 1. This assumption flies in the face of reality, making the ecliptic always vertical, whereas only for an observer on the equator is even the mean value of *a* a right angle.

(2) As argument, replace $\Delta\lambda$ by T, the hour angle of the as yet undetermined apparent conjunction. This step is much less drastic, and in fact Ḥabash speaks repeatedly of the distance from the conjunction to upper midheaven.[10]

Expression (3) then becomes

(4) $$P = 24 \sin T, \text{ in time degrees,}$$
$$= 0;4 \times 24 \sin T, \text{ in hours,}$$

which is expression (2). Or perhaps the originator paid no attention to the underlying geometric situation and simply put down (4) as an example of the sinusoidal interpolation common in Indian and early Islamic astronomy. T is defined implicitly by

$$t = T - 24 \sin T,$$

equivalent to (1) above. The technique of solution by iteration was also common in early astronomy.

THE LUNAR VISIBILITY TABLE

On f. 38r of the manuscript of the *zīj* we find a "Table for the Visibility of the Lunar Crescent, for Latitude 38°10′," (*Jadwal rū'yat al-ahalla li ʿarḍ* 38,10). This also has a marginal gloss in Mongolian which, according to Professor Franke, says "moon visibility thirty-eight latitude," all Mongolian words except that for "latitude" the Arabic *ʿarḍ*, has been transliterated. Notice that the ten minutes of arc have been dropped. The independent variables are the integer degrees of lunar latitude β between 5° and -5°, and the solar position λ with intervals of 10 degrees, beginning with 0° Aries, and expressed in zodiacal signs plus degrees. The table provides for each combination of these λ and β an entry $f(\lambda,\beta)$, tabulated in degrees and minutes. The entries for β = 5°, 0°, and -5° are presented below in Table 2. We have omitted the other entries in the table, since they were obtained by linear interpolation between $f(\lambda,0°)$ and $f(\lambda,5°)$ (for positive β), or $f(\lambda,0°)$ and $f(\lambda,-5°)$ (for negative β), but we have used these additional entries in the manuscript in order to check that the entries presented here are free from scribal errors.

The table can be used for the prediction of the moment of first visibility of the lunar crescent, indicating the beginning of the new month in the Islamic calendar. For the first few evenings after luni-solar conjunction, compute the solar longitude λ_1, the lunar longitude λ_2, the lunar elongation $\Delta\lambda = \lambda_2 - \lambda_1$, and the lunar latitude β. Find $f(\lambda_1,\beta)$ by means of the table. The crescent will be visible if $\Delta\lambda \geq f(\lambda_1,\beta)$, otherwise it will be invisible. Since the lunar elongation increases by approximately 12° per day, the table implies that the moment of first visibility can occur already 17 hours (for λ = 70°, β = 5°) after conjunction, while the crescent may also remain invisible as long as 2½ days (for λ = 160°, β = -5°).

10. Ḥabash, *Al-Zīj al-Maʿrūf bi'-Dimashqī*, f. 210a.

TABLE 2

λ	β = 5°	β = 0°	β = -5°	λ	β = 5°	β = 0°	β = -5°
0	8;37	9;39	10;43	180	12;50	19;39	29;18
10	8;30	9;37	10;59	190	12;25	19; 0	28;11
20	8;19	9;38	11;16	200	11;55	18;08	26;45
30	8;07	9;41	11;35	210	11;12	17;03	25;05
40	7;54	9;45	12;09	220	10;37	15;57	23;13
50	7;41	9;44	12;52	230	9;39	14;45	21;20
60	7;28	10;15	13;59	240	9;28	13;33	19;22
70	7;25	10;43	15;18	250	9;18	12;34	17;37
80	7;31	11;25	16;43	260	8;15	11;41	16;03
90	7;56	12;22	18;46	270	8;00	10;57	14;34
100	8;09	13;28	20;29	280	8;01	10;16	13;42
110	9;20	14;48	22;53	290	7;51	10; 0	12;38
120	10; 9	16; 8	25; 4	300	7;56	9;46	12; 0
130	10;53	17;28	27;20	310	8;18	9;31	11;38
140	11;41	18;26	28;37	320	8;15	9;37	11;18
150	12;36	19;21	29;52	330	8;22	9;36	11; 1
160	12;53	19;53	30;31	340	8;30	9;35	10;54
170	12;57	19;53	30;23	350	8;39	9;33	10;50

The manuscript does not explain how the table was computed. We will now analyze the mathematical structure of the table, and we begin with some general remarks.

First visibility of the lunar crescent will take place between one-half and one hour after sunset, when the moon is about to set on the western horizon. The prediction of first visibility is actually a very complicated problem because many factors have to be taken into account, such as the solar depression at the moment of moonset, the lunar elongation, the distance between the moon and the brightest point on the horizon, the apparent size of the moon (which depends on its distance to the earth), weather conditions, and so on. Most of the known medieval Islamic lunar visibility tables are based on one simplified visibility criterion. In what follows we will pay special attention to a special type of lunar visibility criteria, for which we introduce the term "solar criteria." A solar criterion is a criterion which implies that visibility of the lunar crescent can be predicted on the basis of (at most) the terrestrial latitude φ of the locality, the solar depression d, and the solar azimuth z at the moment of moonset. The following two criteria, both widely used in Muslim astronomy[11] satisfy this definition:

1. The lunar crescent will be visible if and only if the sun is at least a fixed amount $c°$ below the horizon at the time of moonset.

2. The lunar crescent will be visible if and only if the difference in setting time between sun and moon is at least a constant number c of time-degrees (360 time-degrees correspond to a complete daily rotation). Note that the time interval elapsed since sunset is determined by φ, d, z.

11. For example, Pingree, *The Astronomical Works of Gregory Chioniades*, Vol. 1, The *Zīj al-ʿAlāʾī*, 2 parts, p. 952.

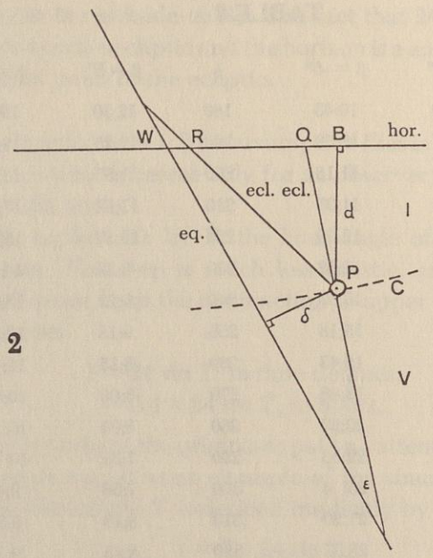


Figure 2

One final remark should be made about solar criteria. Because for a fixed φ the visibility is determined by d and z, one can as a general rule distinguish on the celestial sphere below the western horizon an area I, containing the solar positions (d, z) such that the moon will be invisible, and an area V, containing the (d, z) for which the moon will be visible; I and V are separated by a curve C (see Figure 2).

We now return to Table 2, and assume as a working hypothesis that it was accurately computed on the basis of a solar criterion. We consider a point P on the curve C with declination δ less than the obliquity ε of the ecliptic (see Figure 2). During a complete revolution of the celestial sphere, P will meet the ecliptic two times, at points with ecliptical longitude λ and 180°-λ. We call the intersections of the ecliptic with the horizon at these two moments Q and R. Then $PQ = f(\lambda,0)$ and $PR = f(180°-\lambda,0)$ while angle QPR is determined by λ and ε. Assume a value for ε. Then, if $\lambda = n \times 10°$ for $0 \le n \le 36$, $n \neq 9,27$, one can read off PQ and PR from the table, and compute angle QPR, so that the spherical triangle PQR can be solved, and the angles between the ecliptic and the horizon at P and Q can be found. In the spherical triangle defined by one of the two positions of the ecliptic, the celestial equator, and the horizon, one knows three elements, so that this triangle can be solved, and the angle between the equator and the horizon can be found. The complement of this angle is the geographical latitude φ. One can now compute other interesting parameters, such as the time elapsed since sunset, and the solar depression and azimuth. All these computations are routine applications of spherical trigonometry. However, if angle QPR is small, small errors in $f(\lambda,0°)$ and $f(180°-\lambda,0°)$ can produce enormous deviations in the computed values of φ. Thus the computed value of φ is unreliable if λ is near 90° or 270°.

When this method was carried out for the pairs $f(\lambda,0°)$ and $f(180°-\lambda,0°)$ in Table 2, it was found that the resulting geographical latitudes were nearly constant (except for λ close to 90° and 270°). For $\varepsilon = 23;50°$ the resulting geographical latitudes φ were close to the value 38;10°, mentioned in

the manuscript, but for $\varepsilon = 23;30°$ they were much nearer to 38;30°. We therefore inferred that the table was computed for $\varphi = 38;10°$ and for the Ptolemaic value $\varepsilon = 23;51°$. However, neither the solar depression nor the difference in setting time were nearly constant. Thus it seemed that the table was computed on the basis of a solar criterion, different from the two criteria mentioned above.

Once the geographical latitude is known, one can compute the solar depression corresponding to any value of λ, also for the values for which the above method is useless. It turned out that for $50° \le \lambda \le 130°$ and $180° \le \lambda \le 360°$, the solar depression is very nearly a linear function $g(w)$ of the distance $w = |90°-z|$ between the west point W and the perpendicular projection of the sun (the brightest point B) on the horizon, with extreme values $g(0°) = 9;20°$ and $g(39;20°) = 8;18°$. If we put $g(40°) = 8;18°$, and extend the function linearly, we obtain $g(180°) = 4;40°$, exactly half of 9;20° (if $w = 180°$ B is the East point). For $0° \le \lambda \le 40°$, and $140° \le \lambda \le 180°$, the solar depression was found to be very close to $g(\delta)$, with δ the solar declination.

We note that functions similar to g occur in the lunar visibility theory of Thābit ibn Qurra.[12] However, in the theory of Thābit, the argument of g is the distance between the moon and the brightest point on the horizon. Thābit's approach makes much more sense. Neverthless, the above-mentioned calculations support the hypothesis that the $f(\lambda,0°)$ were computed for $\varepsilon = 23;51°$, $\varphi = 38;10°$, on the basis of the following visibility criterion:

Let w be the distance between the west point W and the brightest point B on the horizon, and let g be the linear function of w with $g(0°) = 9;20°$ and $g(180°) = g(0°)/2$. The lunar crescent will be visible if and only if the solar depression at moonset is at least equal to $g(w)$.

The actual computation of the $f(\lambda,0°)$ must have been carried out somehow as follows. Beginning with a value λ, one first computes the declination δ. Then one must estimate w. Small errors in w do not have much influence, because g varies only slowly with w. Sanjufīnī seems to have used the bad estimate $w \approx \delta$ for $0° \le \lambda \le 40°$ and $130° \le \lambda \le 180°$, but for the other values of λ his estimate must have been more accurate. In the recomputed table, $w = \delta$ has been used for $0° \le \lambda \le 40°$ and $130° \le \lambda \le 180°$, and for the other λ, w has been computed using 9;20° as an approximation to the solar depression. From w one derives the real solar depression $g(w)$. By a standard method in Islamic timekeeping, one can compute the hour angle of a point from its declination and altitude above the horizon.[13] One can apply this method for computing the hour angle h of the point on the celestial sphere diametrically opposite to the sun, and hence the hour angle of the sun itself. Since the right ascension of the sun is known, one can now determine the right ascension of the west point on the horizon, and hence the oblique ascension $\lambda + f(\lambda,0°)$ of the setting point of the ecliptic. Table 3 has been recomputed by means of the sketched procedure. The agreement is reasonable; discrepancies may be caused by different estimates for w from that which Sanjufīnī may have used.

Other explanations of the mathematical structure of $f(\lambda,0°)$ are possible, but we prefer the one given because it involves only three parameters (φ, ε, and the maximal solar depression 9;20°), and because it is related to a criterion used by Thābit ibn Qurra.

12. In R. Morelon, "Fragment arabe du premier livre du Phaseis de Ptolémée," *Journal for the History of Arabic Science* 5 (1981) 3-22.

13. See for example, Al-Marrākushī, *Jāmiʿ al-mabādiʾ wa'l-ghāyāt fī ʿilm al-mīqāt*, in the facsimile-edition "Comprehensive Collection of Principles and Objectives in the Science of Timekeeping," (Frankfurt, 1984) vol. 1, or the French translation: J.-J. Sédillot, L.-A. Sédillot, *Traité des instruments astronomiques des Arabes*, Paris 1834 (reprint Frankfurt, 1984, on p. 263 read "Prenez le sinus de la différence"), text, pp. 122-124, transl., pp. 261-265; or Kennedy, "Spherical Astronomy," pp. 43-46.

We have been unable to find a satisfactory mathematical explanation of the entries for $\beta = \pm 5°$. In an accurately computed table, one expects that $f(\lambda,0°)$ is approximately the mean of $f(\lambda,5°)$ and $f(\lambda,-5°)$, but this is not so in Table 2. It is conceivable that Sanjufīnī (or whoever else compiled the table) computed the $f(\lambda,0°)$ himself, but plagiarized the $f(\lambda,5°)$ and $f(\lambda,-5°)$ from another table. Further investigations along these lines were unsuccessful.

TABLE 3: Recomputed values for $f(\lambda,0°)$

Parentheses contain the errors in minutes, $f(\lambda,0°)$ minus the recomputed value.

0	9;39	(0)	120	15;53	(+15)	240	13;37	(-4)
10	9;36	(+1)	130	17;01	(+27)	250	12;37	(-3)
20	9;36	(+2)	140	18;43	(-27)	260	11;45	(-4)
30	9;41	(0)	150	19;23	(-2)	270	11;02	(-5)
40	9;51	(-6)	160	19;45	(+8)	280	10;28	(-12)
50	9;42	(+2)	170	19;50	(+3)	290	10;02	(-2)
60	10;05	(+10)	180	19;39	(0)	300	9;45	(+1)
70	10;39	(+4)	190	18;55	(+5)	310	9;35	(-4)
80	11;24	(+1)	200	18;06	(+2)	320	9;31	(+6)
90	12;21	(+1)	210	16;59	(+4)	330	9;31	(+5)
100	13;28	(0)	220	15;50	(+7)	340	9;35	(0)
110	14;40	(+8)	230	14;42	(+3)	350	9;35	(-2)

BM 96679: A New Inanna Iršemma

SAMUEL NOAH KRAMER

BM 96679 is a fairly well-preserved single column tablet inscribed with an *iršemma* of Inanna in which the goddess depicts herself as a weeping, moaning, breast-beating woman because of the misfortune and calamity suffered by her cities and temples which she was forced to abandon. The composition, as I tentatively interpret it, may be divided into three sections. The first consists of two parts. It begins with a plaint by the goddess that the honored Enlil, the Father of the Land, had confounded and dumfounded her cities and temples: Erech with its Eanna, Zabalam with its Giguna, Nippur with its Baradurgarra, Ur with its Edilmunna, Agade with its Eulmaš (lines 1-17).[1] As a consequence, the goddess continues, she abandoned all these cities and temples and did not know where to turn (lines 18-25). There follows a rather fragmentary, unintelligible passage in which the goddess probably speaks of her decision to go to Enlil's house and reproach him for the pitiful, pathetic position in which he had placed her (lines 26-33). This rather chiding address to Enlil takes up the entire third section of the composition which also consists of two parts. The first is characterized by a repeated refrain-like demand by Inanna that Enlil tell her, the woman who circles the Land, who is his child, his bride's companion, his favorite, where is the house in which she might live and rest now that her husband and son no longer live there (lines 34-43). In the second part Inanna seems to try to arouse Enlil's pity and compassion by portraying herself as a tragic homeless figure whose situation was worse than that of dumb animals: even the bird and fish, the dog, the ox and cow, the ewe and small cattle, have a place to live, sit, lie, crouch, but she has nothing comparable, and so can do nothing but weep, moan, and beat her breast.

It is a profound privilege, sad and poignant, to dedicate this melancholy composition to the memory of Abe Sachs, whose gentle, lovable nature I first learned to appreciate in one of my intermittent stays at the Oriental Institute of the University of Chicago, when he was on the staff of the Assyrian Dictionary, and whose invaluable scholarly contributions in a cuneiform research area far removed from my own, I followed over the decades with no little admiration and wonder.

1. Beginning with line 11, the obverse is very fragmentary and my attempted restoration and translation of lines 11-25 are no more than "brave" attempts at fairly reasonable conjectures; see the commentary for details.

Transliteration

Obverse
me im-ma-an-mar me-me im-ma-an-mar
nu-nuz ma-ra me im-ma-an gar me-me im-ma-an-mar
a-lum-e me im-ma-an-mar me-me im-ma-an-mar
ù-mu-un-e ^{d}mu-ul-líl-e a-a ka-na-ág-gá-ka
ga-ša-an-an-na ma-ra me-me im-ma-an-mar
mu-gig-an-na ga-ša-an-an-na-ke$_4$
kur-gul-gul ga-ša-an-é-an-na-ke$_4$
an-dúb-ba ga-ša-an-gi$_6$-pár-ra-ke$_4$
lu-lu-na ga-ša-an-tùr-amaš-a-ke$_4$
a-a-^{d}mu-ul-líl urú-mà me-me im-ma-an-mar
urú-mà ki-unu^{ki}-ga [é-an-na-ta] me-me im-ma-an-mar
zabalam^{ki}-[a gi-gu$_{15}$]-na-ta me-me im-ma-an-mar
nibru^{ki}-a [bára-dúr-ga-ra-ta] me-me im-ma-an-mar
urí^{ki}-[ma é-dilmun-na-ta] me-me im-ma-an-mar
é-k[iš-nu-gál é-^{d}nanna-ta ma-ra
me-me] im-ma-an-mar
a-[ga-dè^{ki}-a é-ul-maš-ta me-me] im-ma-an-mar
u-[ru mà me im-ma-an-mar me-me] im-ma-an-mar
me[-e urú-mà é-mu da-àm-šub me-šè] da-àm-di
u[nu^{ki}-ga é-an-na da-àm]-šub me-šè da-àm-di
[zabalam^{ki} a gi-gu$_{15}$-na da-am-šub me]-šè da-àm-di
[nibru^{ki}-a bára-dúr-gar-ra da-àm-šub me-šè] da-àm-di
[uri^{ki}-ma é-dilmun^{ki}-na da-àm-šub me-šè da]-àm-di
[é-kiš-nu-gál é-^{d}nanna] da-àm-šub
[me-šè da]-àm-di
[a-ga-dè^{ki} a é-ul-maš da]-àm-šub
[me-šè-da]-àm-di
[urú-mà é-mu da-àm-šub me-šè da]-àm-di
. . .
. . .
Reverse . . .
éš-dam-mà . . .
é-?-ad-da-mà gi$_4$-in-me-a-aš-bi al-è-dè-eš
mu-gig-an-na-mèn e-en da-àm-ḫun
a-a-mu u$_6$ ga-e-dug$_4$ é-e ga-ša-an-bi-ta
^{d}mu-ul-líl u$_6$ ga-e-dug$_4$ é-e ga-ša-an-bi-ta
me-e me-a é-mu ma-ra dug$_4$-ma-ab
nu-nuz-ka-na-ág-nigin é-mu ma-ra dug$_4$-ma-ab
urú-ti-la-mu me-a ma-ra dug$_4$-ma-ab
é-ní-dúb-mu me-a ma-ra dug$_4$-ma-ab
^{d}mu-ul-líl ṭu-mu-zu-mèn é-mu me-a ma-ra dug$_4$-ma-ab
mu-gig nimgir-si-zu-mèn é-mu me-a dug$_4$-ma-ab
ga-ša-an-an-na ám-šà-ga-zu-men é-mu me-a ma-ra-dug$_4$-ma-ab

é-mu me-a é-ambar-si-ig-mu me-a ma-ra dug$_4$-ma-ab
é-dam-nu-ti-mèn é-ṭu-mu-šè nu-um-di-en
ga-ša-an-an-na-mèn é-dam-nu-ti-mèn é-ṭu-mu-šè nu-um-di-en
mušen ZUM ì-tuku me-e ZUM-mu ság-di
ku$_6$-e a-sur-ra ná-a me-e ki-saḫar-mu nu-um-ma-al
ur-re kun$_4$ gam-ma me-e kun$_4$ nu-tuku
gud é-tùr ì-tuku me-e é-tùr nu-tuku
áb-e ki-tuš ì-tuku me-e ki-tuš nu-tuku
u$_8$-e máš ì-tuku me-e maš nu-tuku
máš-anše ki-^{giš}ná ì-tuku me-e ki-^{giš}ná nu-tuku
nu-nuz-mèn mu-lu-ír-re-še-ša$_4$-gaba-sìg-ga-mèn

---

ir-šèm-ma-^{d}inanna

Translation

Obverse
He has made it mute, he has struck it dumb,
For me the woman, he has made it mute, he has struck it dumb,
The honored one has made it mute, has struck it dumb,
The Lord Enlil, the Father of the Land,
Has struck it dumb for me, the Queen of Heaven,
The hierodule of An, the Queen of Heaven,
Who destroys all the foreign lands, the Queen of Eanna,
Who makes tremble the heavens, the Queen of Gipar,
Luluna, the queen of stall and fold,
Father Enlil has struck my city dumb,
Has struck dumb my city Erech [with the] Eanna,
Has struck dumb [Zabalam with the Gigu]na,
Has struck dumb Nippur [with the Baradurgarra],
Has struck dumb Ur [with the Edilmunna],
Has struck [dumb] for me the Ekiš[nugal, the house of Nanna],
Has struck [dumb] A[gade with the Eulmaš],
[He has made mute my] city, he has struck it [dumb].
I, [I shall abandon my house in my city—whither] shall I go?
[In Erech I shall] abandon [the Eanna]—whither shall I go?
[In Zabalam I shall abandon the Giguna—whi]ther shall I go?
[In Nippur I shall abandon the Baradurgarra—whither] shall I go?
[In Ur I shall abandon the Edilmunna—whither shall I] go?
I shall abandon [the Ekišnugal, the House of Nanna]—whither shall I go?
[In Agade I shall] abandon [the Eulmaš—whither shall I] go?
[In my city I shall abandon my house—whither shall I] go?
. . .
. . .

Reverse . . .

In my *ešdam* . . .

My father's . . .-house—its colleagues have become frenzied,
I who am the Queen of Heaven—how shall I be comforted,
I will query my father—(about) this house and its Queen,
I will query Enlil—(about) this house and its Queen,
Me—tell me where is my house,
(Me), the woman who circles the Land—tell me where is my house,
Tell me where is the city in which I shall live,
Tell me where is the house in which I shall find rest,
Oh Enlil, me who am your child—tell me where is my house,
Me, the hierodule, who am your bridesmaid—tell me where is my house,
Me who am the Queen of Heaven, who am your favorite—
tell me where is my house,
Where is my house, the house that calms the canebrake—tell me where is my house,
I who am one in whose house the husband is not living—I will
not go to the son's house,
I who am the Queen of Heaven, who am one in whose house
the husband is not living—I will not go to the son's house.
The bird has a nest(?), I—my nest(?) has been scattered,
The fish lies in deep water, I—my dust-(filled) ground does not exist,
The dog crouches on the doorstep, I—I have no doorstep,
The ox has a stall, I—I have no stall,
The cow has a place to sit, I—I have no place to sit,
The ewe has a fold, I—I have no fold,
The small cattle have a place to lie, I—I have no place to lie,
I, the woman, am a weeping, moaning, breast-beating figure.

An iršemma of Inanna

Commentary

Lines 1-10: In lines 1ff., the rendering "He made it mute, he struck it dumb," attempts to paraphrase the more literal meaning of me im-ma-an-mar me-me im-ma-an-mar, "He has established silence in it, he has established silence, silence in it." The "it" in "in it" refers to "my city" (line 10); compare especially *Lament over Sumer and Ur* line 59: ^{d}en-líl-le u_4-gig-ga mu-un-zal uru-a me bí-ib-gar, "Enlil has made the day break bitter, has made the city mute," and *Lament over Ur* line 200: u_4-kalam-til-til-e uru-a me bí-ib-gar, "The Land-annihilating storm has made the city mute," where uru-a clearly indicates that the compound verb me—gar governs a locative.[2] In line 2 (and also line 5) the nuance intended for the dative ma-ra, "for me," is not clear;

2. Note, therefore, that the verbal form in our text might have been expected to read im-mi-in-mar. For additional examples of the rather ambiguous me—gar, cf. *CAD* sub *qālu* and *qūlu*, and Åke Sjöberg, TCS 3, pp. 143-144.

perhaps it should be rendered "because of me," that is, perhaps the calamity inflicted by Enlil on her city was due to some transgression on the part of Inanna; or perhaps the panic and terror that struck the city dumb, was due to the affliction suffered by Inanna at the hand of Enlil that forced her to abandon her cities and temples.[3] In line 3, a-lum is assumed to be a variant of e-lum (Emesal alim). In line 4, the -ka at the end of the line seems to be a scribal error for -ke_4. In lines 6-9, the final -ke_4 seems grammatically unjustified. In line 9, lu-lu-na is probably a variant for ^{d}líl-lá-en-na.[4] In line 10, the subject element is missing following ^{d}mu-ul-líl.

Lines 11-25: The names of Inanna's temples[5] restored in these lines are well known. The restoration of -ta at the end of the temple names is based on the -ta following gi-gu_{15}-na- in line 12; its very tentative rendering "with" assumes that it is a variant of -da. The restoration of line 15 (and also line 25) is no more than a guess based on the context, and may turn out to be quite erroneous. In lines 18-25, the restoration of the verbal form da-àm-šub is quite certain despite the fact that they are not fully preserved in any one of the lines.

Lines 26-33: This fragmentary passage which may be reasonably assumed to concern Inanna's decision to go to Enlil's temple in order to demand, at least rhetorically, that he tell her where she might find a place to live now that she has abandoned her cities and temples, presents numerous problems, grammatical and contextual. In line 29, the reading and rendering of the first complex is rather uncertain; if correct, the line may perhaps be assumed to have portrayed the hierophants of Inanna in her *ešdam* lamenting for their suffering Queen. Line 30 may perhaps also be rendered "In[6] my father's . . .-house,[7] their peers have become frenzied",[8] "their" referring to the assumed hierophants of the preceding line. In line 31, the reading of the penultimate complex as e-en is quite uncertain; for its rendering "likewise," cf. CAD sub *kīam*. In lines 32-33, the rendering assumes that u_6 ga-e-dug_4 is the first person optative form of the compound verb u_6—dug_4, "to look inquiringly", "to query," despite the fact that one might have expected the verb to read u_6 da-àm-dug_4 rather than u_6 ga-e-dug_4;[9] as for the rendering "(about) this house and its Queen," this is no more than a very dubious conjecture for the meaning of é-e ga-ša-an-bi-ta, an ambiguous phrase that is difficult to account for both grammatically and contextually.[10]

3. In this line note that the -gar of the first verbal form was no doubt a scribal lapse for -mar.

4. Cf. Mark Cohen, *Sumerian Hymnology: The Eršemma*, *HUCA* suppl. 2 (Cincinnati, 1981), p. 147 and comment to line 7 on p. 196. Note that lu-lu-na as an epithet of Inanna is also found in CT 42 14 5; see my comment in "CT XLII: A Review Article," *JCS* 18 (1964) 44 n. 70, where however, my reading lù(?)-lù-na is to be corrected to lu-lu-na.

5. The one exception is my very dubious restoration of Nanna's temple, the Ekišnugal in line 15 (and also line 23) that begins with the signs É and KIŠ. Note, too, that this is the only one of lines 11-16 that has the complex ma-ra (the reading is not quite certain) preceding me-me.

6. Note, however, that if so, the complex might have been expected to end in -ka.

7. I cannot identify the second sign on the line.

8. Note that gi_4-in-me-a-aš seems to be a variant for gi_4-me-a-aš and that the reading of al-è-dè-eš is uncertain.

9. For the compound verb u_6—dug_4, cf. *CAD* sub *ḫāṭu*, and especially Raphael Kutscher, "Oh Angry Sea," Yale Near Eastern Researches 6 (1975) p. 132 sub 237, where the complex u_6 NE-dug_4 is read as u_6 dè-dug and rendered "look at (your city), let me say," and Cohen, *Sumerian Hymnology*, p. 184 sub 1, where the complex is read u_6 bí-dug_4 and rendered "you have watched over (your city)." To judge from the context, I would read u_6 NE-dug_4 (with Kutscher) as u_6 dè-dug_4, but render it "may you look inquiringly at (your city)," although, as Cohen points out, one might have expected the *marû* form of the verb rather than the *ḫamtu*.

10. Note that the first complex in line 33 might have been expected to read ^{d}mu-ul-líl-le, since the compound u_6—dug_4 governs a dimensional object.

Lines 34-51: In line 35, the scribe seems to have accidentally omitted me-a before é-mu.[11] For nimgir-si in line 39, cf. CAD sub *susapinnu* and the bibliographical references there cited: "your bridesmaid" seems to be an elliptical turn of phrase for "the bridesmaid at your wedding," that is, Inanna claims that she was Ninlil's bridal companion at the wedding of Enlil and Ninlil. In line 40, the rendering "your favorite" for ám-šà-ga-zu is a reasonable surmise. In line 41, the significance and implication of Inanna's calming the canebrake, assuming the translation is correct, are rather obscure. In lines 43-44, the significance and implication of Inanna's declaration "I will not go to the son's house," are obscure; usually in the iršemma's the calamity suffered by the son is identical with, or parallel to, that suffered by the husband, but this does not seem to be so in this iršemma. In line 44, the rendering of ZUM by "nest," is no more than a conjecture based on the context;[12] "has been scattered" renders ság-di as if it were a finite verbal form.[13] In line 45, for a-sur-ra, cf. CAD sub *asurrakku*; "my dust-(filled) ground," attempts to render ki-saḫar-mu; "does not exist," renders nu-um-ma-al, more literally "has not been brought into being." In line 50, the determinative giš of ki-^{giš}ná seems unnecessary.[14]

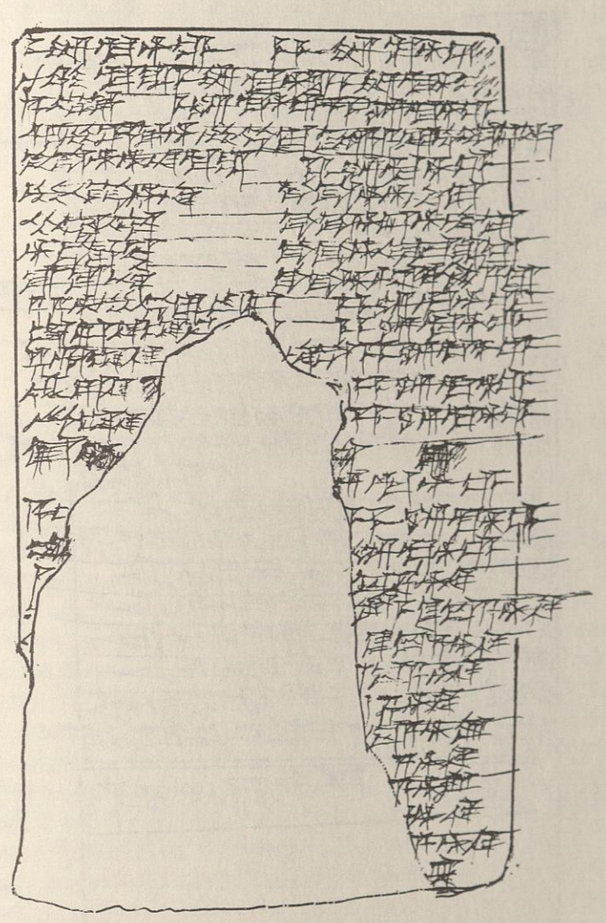
11. Note, too, that one might have expected -mèn following the first complex.

12. Note that the expected subject element is missing following mušen, as well as following gud in line 47, while it is written following ur in line 46, where it is grammatically unjustified.

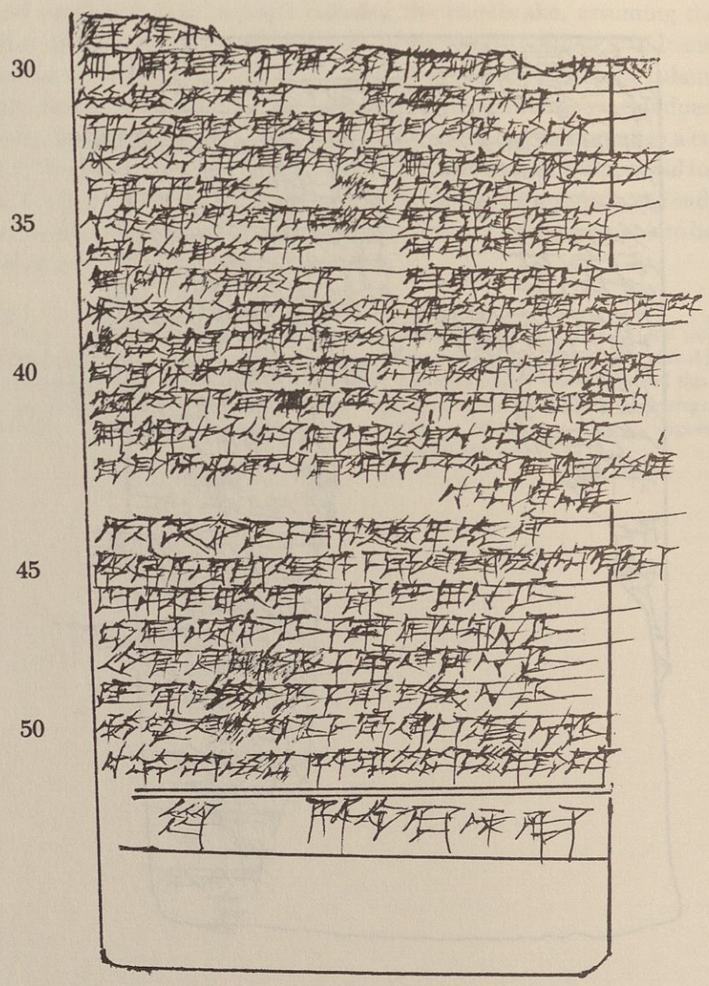
13. So, too, ná-a in line 45, and gam-ma in line 46 are rendered as if they were finite verbal forms.

14. Preliminary translations of this composition have been published in my *From the Poetry of Sumer* (Berkeley, 1979), pp. 91-93; these are now superceded by the translations in this edition of the text.

96679 obv.



96679 rev.



An Old Akkadian List of Sumerian Personal Names

W. G. LAMBERT

One of the most remarkable things about Abraham Sachs was the wide sweep of his learning. From his publications some thought that he was simply a specialist in mathematical and astronomical texts. In fact Late Babylonian administrative and economic texts were another major concern of his. And in conversation it appeared that there was hardly any subject from ancient Mesopotamia in which he was not well read, and on which he had not thought deeply, so that he could offer highly intelligent and original comments off the cuff. Thus no apology is needed for offering in his honour here an unusual Sumerian list. Were he still with us he would certainly read it with keen interest and probably solve some of the problems we have not.

The form of this list is unusual. It is a solid clay hexagonal prism, 163×60 mm. (maxima), now numbered BM 86271 (99-6-10, 1) in the British Museum, with permission of whose Trustees it is published here. To judge from the sign forms it is Old Akkadian. It reached the British Museum with the 99-6-10 collection, from which 87 Old Akkadian documents were published by E. Sollberger in CT 50, most of them clearly from Lagash. On this evidence the prism is also most likely from Lagash. There is another piece of evidence. V. K. Shileiko published a very similar six-sided prism from the Likhachev collection.[1] That prism, as now known, contains lines 1-38 of what is called Early Dynastic Lu List A,[2]: lines 1-19 in the first column, lines 20-38 repeated four times in columns II-V, and one vertical line in column vi: ^{d}nissaba lugal.ušum.gal dub.sar^{3}en$_{5}$.si ŠIR.[. . .], "(To) Nissaba: Lugal-ušumgal, scribe, ensi of Lagash." This man, as already known to Shileiko, held the office named under both Narām-Sîn and Šar-kāli-šarri, though it is unclear whether he personally wrote the Likhachev prism, or whether it was written by another scribe on his behalf. The prism was acquired by Likhachev in Istanbul in 1901 or 1902, and he was offered a similar item, but lacking the dedication in the one column, by a Paris dealer.[4] Though BM 86271

1. In *Votivnyya nadpisi Shumeriiskikh pravitelei* (Leningrad, 1915), pp. 12-14 and pl. C (copy, photograph and comments) and in ZA 29 (1914-15) 78-84 (copy and different comments).
2. In fact the PA is written close up to the first half of the sign SAR, the second half of which is omitted. Shileiko took this as a ligature, but perhaps it was a simple error.
3. MSL 13, pp. 4ff.
4. ZA 29 (1914-15) 78 n. 1: year not recorded.

was obtained from a London, not a Paris dealer, probably it is the prism once offered to Likhachev.

The Likhachev prism is smaller than BM 86271: 115×23 mm. according to ZA 29 78, but there is a problem because on the photograph it measures ca. 150×47 mm. Also the BM prism, far from having space to spare, fills every column with script, even putting the last line of each on the bottom surface. The only dedication is "Nissaba" on the top (as we now read the script). The first column begins with the single sign NIN-, the remaining 143 lines in the six columns offer names beginning Nin-. The majority are persons' names, a few could be divine names lacking the determinative ^{d} (e.g. lines 3, 20, 81, 113, 141), but they could also be personal names of the type divine name plus genitive, "He/She of the god . . .," and this is the more probable explanation of them. This is thus a scholarly list, not an administrative document. There is some arrangement of names by known principles, e.g. lines 15-17: nin.ma.DU, nin.igi.DU, nin.igi.bar, but this applies to small groups only, not to the whole list. Note how nin.me.lám (line 2) and nin.me.lám.sù (line 38) are far apart. Also nin.ú occurs twice (lines 41 and 116), as does nin.ama (lines 24 and 140), which suggests that this list may have been compiled from existing materials.

Lists of personal names compiled for school purposes are a well known genre of the Old Babylonian period.[5] Sumerian, Akkadian, and even Amorite personal names circulated in lists at this period, and a list of Sumerian names beginning with Nin- has been edited by B.Landsberger.[6] This list is not complete (the end is lost), but to judge from other complete sections of this material it is highly improbable that it contained even 50 names. It seems that not a single piece of academic name list has been found in Early Dynastic script, so that BM 86271 is the earliest identified surviving list of personal names. From Nippur there is an Old Akkadian exercise tablet with five personal names, all beginning Ur-, written out by the teacher on the left hand side of the tablet, then copied by the student on the right hand side.[7] While it is correct to see BM 86271 as an early stage of the scribal tradition better represented by surviving Old Babylonian examples, only five of the names preserved on BM 86271 also appear in the 22 names of Landsberger's reconstructed list: 7 = 17; 20 = 19; 44 = 18; 74 = 2; 123 = 11. Thus no connection is to be assumed.

The lack of any nin- compounds that are not personal names, such as the professional title nin.dingir.(ra), proves that BM 86271 is not simply a general lexical list, such as a "SAG-tablet," but is specifically meant as a list of personal names.

The present publication aims, so far as possible, to establish a correct text of this important list, both copy and transliteration. Some notes on particular names are given, but only casually. The study of Sumerian personal names is an underdeveloped field. The main problems beyond those of grammar, lexicon, and concepts which any Sumerian text may present, are of grammar and abbreviation. Take the latter first, of the two names already quoted from this list, nin.me.lám and nin.me.lám.sù, it can be argued that the former is nothing other than an abbreviated version of the latter, which may mean "the lady is full of splendour." Even if this should be historically true (we have, of course, no final way of proving the matter), it is always possible that in due course the native users of these names had forgotten about the origin of the short form and considered it to mean simply "the lady of splendour." Each of the translations we have proposed would of course have appropriate grammatical elements, but we do not know whether personal names, where appropriate, had to be complete sentences or could be simply phrases; that is, was "the

5. See especially E. Chiera, PBS 11/1-3; B. Landsberger apud M. Çığ and H. Kızılyay, *Zwei altbabylonische Schulbücher aus Nippur* (Ankara, 1959), p. 110; and the bibliography of R. Borger, *HKl* 3, p. 111.

6. MSL 13, pp. 4ff.

7. TuM 5 172 (copy) = A. Westenholz, *Early Cuneiform Texts in Jena* (Copenhagen, 1975), p. 87 (transliteration) and pl. xxii (photograph).

lady is full of splendour" de rigeur, or would "the lady full of splendour" suffice? Here the grammatical problems exceed those of ordinary textual grammar of Sumerian texts because it appears that at no period was it compulsory to incorporate the grammatical elements of a personal name within the grammar of the sentence. This may be done, but it need not be.

No large list of Sumerian personal names from the Old Akkadian period has been published in the modern world, so for comparison we have used mainly the list for late Early Dynastic Lagash by V. V. Struve[8] and the Ur III list of H. Limet[9] abbreviated here as "L" (for Lagash) and "Ur III" respectively. A detailed study of this list would be of book length. The present article merely introduces it to the world of scholarship.[10]

BM 86271 (99-6-10, 1)

col. i		col. ii		col. iii	
1	⌜NIN⌝	26	nin.mas.su	49	nin.x.KI
2	nin.me.lám	27	nin.ama.mu	50	nin.U
3	nin.kur	28	nin.[ḫ]é	51	nin.nam
4	nin.⌜EZEN⌝	29	nin.nì.zu	52	nin.dím
5	nin.kur.igi.gál	30	nin.⌜EZEN × X⌝	53	nin.šu
6	nin.áb	31	nin.mu.ma.túm	54	nin.e
7	nin.zi.šà.gál	32	nin.nam.um.[(ma)].e	55	nin.ùru
8	nin.lú.ti.ti	33	nin.nì.du$_7$?	56	[nin].ab.ba.ur[u]
9	nin.x	34	[ni]n.igi.tab	57	[n]in.me.na
10	nin.ša$_6$	35	nin.bànda	58	nin.úr.ra.ni
11	nin.še.⌜URU × KÁR⌝	36	[ni]n.uru$_{16}$	59	nin.gub.ba.ni
12	nin.x.x	37	[n]in.me.gal.[g]al	60	nin.ér.r[e].ba.nígin
13	[nin].x.(x)	38	nin.me.lám.sù	61	nin.gú.ki.a.ba.TÚG
14	nin.⌜EN⌝.x	39	⌜nin.nam.gú⌝	62	⌜nin.EN?.edin⌝.na
15	nin.ma.túm	40	nin.nam.gú.sù	63	nin.ig.kúš
16	nin.igi.du	41	nin.ú	64	nin.íb.ta.è
17	nin.igi.bar	42	nin.a.du$_{10}$	65	nin.a.MI.NI
18	nin.líl.da	43	nin.uru	66	nin.me.lám.š[u]?
19	nin.àga.zi	44	nin.kù.su?	67	nin.en.ra.tú[m]
20	nin.a.zu	45	nin.ig.gal	68	nin.ra
21	nin.nì	46	nin.nì.ša$_6$.ša$_6$.ga	69	nin.nì.zu.zu
22	nin.bur	47	nin.ab(×X)	70	[ni]n.x.x.x
23	nin.dub.sar	48	n[in].x		
24	nin.ama				
25	[ni]n.x.x				

8. *Onomastika rannedinasticheskogo Lagasha* (Moscow, 1984).

9. *L'Anthroponymie sumerienne dans les documents de la 3^{e} dynastie d'Ur* (Paris, 1968).

10. At the Recontre Assyriologique Internationale in Münster, July 1985, the author took the opportunity to show the copy to J. Krecher, who at first glance made some useful suggestions, which have been adopted here. However he had no time to study the text in detail, and, not having seen the present manuscript, is not to be held responsible for any faults in it.

col. iv		col. v		col. vi	
71	nin.zi	96	nin.[. . . .]	121	⌜nin.NI⌝?.e/IŠ?
72	nin.á.daḫ	97	nin.gissu	122	nin.ì.URUD
73	nin.mu.daḫ	98	nin.ḫa.ma.ti	123	nin.ḫé.du$_7$
74	nin.an.né.si	99	nin.tum?	124	nin.ḫé.gál.sù
75	nin.gù.dè	100	nin.x.maḫ	125	nin.inim.du$_{10}$
76	ni[n].s[a]g	101	nin.[(x)].x	126	[n]in.NI.nam.gag.ga
77	nin.gim.a.ba	102	nin.x.x	127	nin.ENGUR.ŠE.x.NI
78	nin.bára	103	nin.[. . .]	128	nin.EN.ḫa.[(x)].ú[r]?
79	nin.igi	104	nin.[(x)].x.[(x)]	129	[n]in.TUR.x
80	nin.ur	105	nin.[(x)].x.[(x)]	130	[n]in.ki.nu.nir^{ki}.e
81	nin.šar	106	nin.[(x)].x	131	nin.nì.šà.a
82	nin.DU	107	nin.[(x)].x	132	nin.á.na
83	nin.ab.ba.igi.gál	108	n[i]n.[(x)].x	133	n[in].x.x.(x)
84	nin.IM	109	nin.x	134	nin.ŠE.x[. . .]
85	nin.maš	110	nin.[m]è.a	135	nin.ì.TÚG.x
86	nin.zabalam(⌜MÙŠ.AB⌝)^{ki}.e	111	nin.x.x.x	136	nin.NE.NI
87	nin.érin	112	nin.me.na.túm	137	nin.dam.gàr
88	nin.má	113	nin.UG	138	nin.é.gi.a
89	nin.ma	114	nin.EN.igi.gá[l]?	139	nin.gá.bí.du$_{11}$
90	nin.ab	115	nin.u.tu.dè	140	nin.ama
91	nin.AN.IM	116	nin.ú	141	nin.šubur
92	nin.ig	117	nin.GÌR	142	nin.nu.dug$_4$.ga
93	nin.dingir.tuku	118	nin.gi.a	143	nin.en.nu
94	nin.šà.lá.tuku	119	nin.nì.[x]	144	[nin. . . .] x
95	[ni]n.[x].gi?.x	120	nin.[x]		

Commentary

Line 2: As almost always, parallels must also be sought in the masculine names beginning lugal-. In this case cf. the Ur III lugal.me.lám.

Line 3: (d)nin.kur.(ra) can be either a god or goddess and it is not clear whether it is one deity of ambiguous gender or two deities that happen to bear the same name.

Line 4: Cf. L: lugal.ezen, Ur III lugal/nin.ezen. There does not seem to have been a sign written inside EZEN.

Line 5: The name of a deity attested in the Ur III document YOS 4 248: dnin.kur.ra.igi.gál (correct line 1.3 from line 1.5 and seal).

Line 7: Cf. Ur III lugal/nin.zi.šà.gál.

Line 8: Cf. L lugal.lú.ti.ti, L and Ur III nin.lú.ti.ti.

Line 10: Cf. L nin.ša$_6$.ga, Ur III lugal.ša$_6$.(ga).

Line 11: In view of Ur III lugal/nin.URU×KÁR^{ki} the še is probably a gloss. So far the reading of URU×KÁR is unknown, but the še may be only the first syllable, not the whole word.

Line 12: The last sign of this name is probably a variant of RÉC 448 bis = LAK 764, which is the same as RÉC 169 = LAK 274 but lacks the initial KASKAL. It is a sign so far attested in the Old

Akkadian period only, and the fullest list of forms is given by Fossey, *Manuel* 2, p. 400. It is basically an angular C shape in outline form, with either one KASKAL in the middle, or two KASKAL's, one over each horizontal limb, and often there is a single horizontal either projecting at the beginning or over the middle of the vertical limb. A similar sign occurs at Ebla: ELLes 302 (MEE 3, p. 359f.) and in the administrative texts, which is based on the same angular C-shape, but with four šeššig wedges, two crossing the upper, two the lower horizontal limb. Also there are two always projecting horizontals at the beginning.

The most recent discussions of these two signs (assumed to be paleographic variants of one sign) are those of M. Krebernik, *Die Beschwörungen aus Fara und Ebla*, p. 141f. and F. Pomponio, *ArOr* 51 (1983) 372-377, both mainly concerned with the Eblaite evidence. (A literary occurrence published since is ARET 5 (1984) no. 6 xvii 3, but it is not understood, and the Ṣalābīkh equivalent of the word is lost, probably in the damaged first line of OIP 99 342 last column.) A list from Ebla gives the name of this sign (and its, or one of its values) as *uš-til-lum/núm* (MEE 3 no. 52 rev. ii 9-10: p. 194 and pl. xxvii). It occurs in Eblaite contexts (with or without the determinative giš) among wooden objects, beds, tables, chariots (giš.nú, giš.banšur, giš.gigir: similarly in a Diyala document: MAD 1 249), and associated with oxen. Thus Pomponio proposed 'chariot,' also in view of the occurrences in the Old Akkadian royal inscriptions and year names, where, with preceding KASKAL, it refers to military victory. The latter evidence should not be brought into the discussion until the signs are proved to be paleographical variants only. Krebernik wanted to make this UŠTIL/N an antecedent of šudul 'yoke' (a wooden object!) known from Gudea's inscriptions and later. This later šudul prefixes šu$_4$ to DUN$_4$, and DUN$_4$ is based on UR, not on an angular C-shape in outline, so the assumption requires a substantial switch in form for this value from Old Akkadian to Gudea, which would only be justified if it were sure that at Ebla the meaning is 'yoke'. E. Sollberger in ARET 8, p. 57 supports Krebernik, but without any demonstration that the contexts require the meaning assumed. The sign-name uštil/n has also to be explained, and Sollberger explains away uštil as "uštil . . . sounds too suspiciously like a sign-name (of the descriptive type) to be right." However, while in later millennia such sign-names as *ušnutillû* "incomplete UŠ" are found, one does not even there find *uštillû* "complete UŠ", scribes use simply *uš* (or, *nittaḫu*). And at Ebla no such descriptive sign-names have so far been found. Thus uštil/n has to be taken seriously. It could be taken as a phonetic variant of the later šudul/šudun, but again only a demonstration of identity of meaning would prove the point. The two initial horizontal wedges in UŠTIL/N could be, or have been, understood as GIŠ in a ligature, cf. geštin, where the first part of the sign was variously construed by the ancient scholars as GIŠ or TAB (MSL 14, p. 364 217-218). Then, this assumed GIŠ could have been rendered muš in Sumerian and uš in Semitic, cf. giš.tùn = *uš-du-mu-um* in the bilingual list from Ebla (MEE 4 477), where the Semitic looks like a loan. The occurrence of Emesal forms at Ebla is not shocking, note that in the standard Emesal list mu = giš, but muš in mu.uš.ki.in.ti = giš.kin.ti (MSL 4, p. 21 154). In the second- and first-millennium texts guruš is Emegi, while mu.ru.uš is Emesal, but at Ebla the sign-name is *nu-rí-šúm* (MEE 3 52 obv. vi 4).

At Ur a single example of giš.uštil/n occurs (UET 2, Sup. 8a, see A. Alberti and F. Pomponio, *Studia Pohl*, Ser. Maior 13, p. 34 and pl. 1), and it has exactly the features of the Ebla examples which distinguish it from RÉC 448 bis = LAK 764. Thus there is no ground for assuming that they are paleographical variants with regional distribution. (No copy or photograph of the Diyala example has been published.) The four šeššig wedges in UŠTIL/N could be written together as KASKAL, note the later forms of šudul and third-millennium forms of kas$_4$ (LAK 485), but while this would allow a greater possibility of identity between UŠTIL/N and RÉC 448 bis = LAK 764,

the preceding KASKAL in RÉC 169 = LAK 274 could hardly be explained in this way, and other evidence now to be given proves that it really is KASKAL.

In the personal name under comment the final sign, so far as can be judged from what remains, probably had the C-shape with a KASKAL (= šeššig?) inside, but it was also tricked out with two other sets of four wedges arranged differently at the beginnings of the uppermost and lowermost horizontal wedges. We propose to take the middle sign as KASKAL and the final one as RÉC 448 bis = LAK 764 in the light of a piece of evidence so far overlooked: PBS 9 67 obv. 6: išib ^{d}nin.KASKAL RÉC 448 bis = LAK 764.ga. Here the resuming -ga disproves a reading uštil/n, and so confirms the paleographical evidence that these are two entirely different signs so far as values go. The meaning can be deduced from the only known later examples of KASKAL + RÉC 448 bis = LAK 764, namely in Proto-Izi, where the form is KASKAL + ITI (for ITI see MSL 14 338 207). It occurs once after Sumerian words for "road" or "journey" (MSL 13, p. 25 240), once between words for "battle" and "defeat" (MSL 13, p. 30 399). This semantic range fits the occurrences in the Old Akkadian royal inscriptions and year names, where it occurs in the Akkadian versions for a masculine noun for "battle", "defeat" and "army". Such a range can be centered on "road": "expedition", "expeditionary force", "successful expedition". The Sumerian equivalents to these Akkadian passages are varied and do not employ RÉC 169. Gelb boldly proposed to read *tāḫazum* in all the Akkadian passages (MAD 3 p. 24), but without justification. For the Sumerian meaning of the sign, the final -ga is the only help, but the present writer has not thought of any Sumerian word for "army", "defeat", or "battle" that ends in -g. As a stab in the dark, perhaps the initial KASKAL was put there merely for the Akkadian word, and the Sumerian root ending in -g is not specifically connected with "road". Then one might consider a word for "weapon", and údug (ŠÍTA), for which see the writer, *OrAn* 20 (1981) 95f, exists. For possible semantic ranges of "weapon" see the meanings of *kakku* in *CAD*. The particular word údug has been suggested because of a goddess in an Ur III document from Umma: ^{d}nin.^{giš}x.ga (TCL 5 6038 iv 21). The sign rendered x has been read dùg hitherto, though in the published copy it is not obviously that. D. Charpin has kindly collated the original and copied the relevant signs: , but was unable to suggest what it might be. It appears to be written over an erasure. It might well in fact be ŠÍTA, with the final upright and two preceding diagonals overlapping a short upright, see N. Schneider, *Die Keilschriftzeichen der Wirtschaftsurkunden von Ur* III, no. 777. This interpretation makes sense of the preceding determinative and resuming ga. We have not of course proved that RÉC 169 is to be read udug. We have simply raised the question for further consideration when more evidence is to hand.

Line 15: Cf. 31; L lugal/nin.ma.túm; Ur III nin.ma.a.túm. The Ur III orthography suggests that the grammar is nin.mu+a+túm: "the lady is fitting to me."

Line 16: This is also found in L and Ur III, read nin.palil by both Struve and Limet, but doubtfully. igi+(šè)+du exists, cf. the Akkadian loans *gešṭû* and *igišṭû*.

Line 18: Cf. L and Ur III ^{d}en.líl.da, no doubt an abbreviation, for which note ^{d}en.líl.da.kala.ga. There is a deity attested later: ^{d}nin.líl.da.gal.di (A. Deimel, *Pantheon Babylonicum*^{1,2}).

Line 19: For the sign rendered àga see E. Sollberger, *AfO* 16 (1953) 230, and cf. L nin.àga.zi.

Line 20: There is of course the well known god of the nether world who bears this name, but since it occurs without the divine determinative as a personal name in Ur III and the Old Babylonian list edited by Landsberger, it may not be the divine name plus genitive used as a personal name here, but a simple personal name such as "the lady (is a) physician."

Line 21: Cf. line 29 and L: nin.nì.mu, Ur III lugal.nì.

Line 22: Attested in L, but since nin.bur.šu.ma also occurs there, nin.bur may be an abbreviation.

Line 23: Cf. the same in Ur III, and lugal.dub.sar.

Line 24: Cf line 27; L offers nin.ama.mu/na, Ur III nin.ama.(mu).

Line 26: Also Ur III. Cf. L and Ur III lugal.mas.su.

Line 32: The final .e (also lines 86 and 130) indicates a verb has been dropped from the end, perhaps ki.ág, cf. Limet, *L'Anthroponymie*, p. 266. For the restoration um.ma cf. L nin. nam.mu.ru.e, where mu.ru is perhaps the kinship term muru$_4$(ÚR × Ú.AŠ) = *emu rabû*.

Line 34: Cf. L lugal.igi.tab/nin.igi.tab.mu.

Line 35: Also L and Ur III, cf. Ur III lugal.bàn.da.

Line 36: Cf. L lugal.me.gal.gal.

Lines 39-40: Cf. L lugal.nam.gú!.sù, Ur III lugal.nam.gú. The meaning given to nam.gú in later lexical texts (= *dullulu, ḫabālu* "oppress"), is hardly correct for this personal name. Cf. UET 6/2 353: nin.nam.gú.sa.a.

Line 41: Cf. L: lugal.ú, Ur III nin.ú.ú.

Line 43: Cf. L lugal.uru.

Line 44: Cf. L and Ur III nin.kù.zu.

Line 45: "Doors" occur in the divine name ^{d}ig.alim and in personal names, cf. also line 63 ("the lady is a weary door"?) and line 92. Note L lugal/^{d}nin.gír.su.ig.gal, Ur III lugal.ig.gal, nin.ig.gal, nin.ig.alim.

Line 47: Cf. 90. It is not clear whether a sign is written within AB. Cf. L lugal.AB.

Line 50: Also Ur III.

Line 53: Cf. L lugal.šu.

Line 54: Cf. Ur III lugal.e.

Line 55: This name raises the question whether the Ur III lugal.šeš has been misread, cf. lugal.ùru (Westenholz, Bi.Mesop. 1 24 iii 5).

Line 56: Cf. line 83. There is hardly room for nin.ab.ba.nir.gál (L), but the Ur III lugal.ab.ba.uru supplies our restoration.

Line 57: Cf. 112, which may be translated "the lady, fitting to her lord": [me] =*be-lum* (MSL 13 185:3). Note also line 74, and compare L me.an.né.si and Ur III lugal.an né.si.

Line 58: Cf. L nin.úr.ni, Ur III lugal/nin.úr.ra.ni.

Line 59: Cf. lugal.gub.ba.ni from Nippur, Westenholz, Bi.Mesop. 1 p. 89.

Line 60: Cf. nin.ér(IGI.A).e from Nippur, Westenholz, Bi.Mesop. 1 24 iii 10.

Line 61: The sign rendered KI does not seem to be ḪAR.

Line 63: See line 45 and note. Also Ur III: Forde, *Nebraska cuneiform texts of the Sumerian Ur III Dynasty* (Lawrence, KS, 1967), 49 3.

Line 64: Also Ur III, also with lugal-; cf. L: lugal.ìb.ta.NI.è!.

Line 65: Is the Ur III nin.á.MI.NI.šè the same name?

Line 66: If šu is correctly restored, it would seem to be an orthographic variant for sù.

Line 68: Also Ur III. Cf. L lugal.ra.

Line 69: Cf. Ur III lugal.nì.zu and nin.nì.zu.(zu).

Line 71: Also from Nippur: Westenholz, Bi.Mesop. 1 23 ix 2, 16; x 23.

Line 72: Cf. Limet, *L'Anthroponymie*, p. 217.

Line 73: Cf. Limet, *L'Anthroponymie*, p. 223.

Line 74: See note on line 57, also Westenholz, Bi.Mesop. 1 23 ix 8.

Line 75: If our interpretation is correct, dè is written for the common later dé.

Line 76: Cf. L lugal.sag.

Line 78: Also L. Cf. L and Ur III lugal.bára.

Line 79: Also L. Cf. L and Ur III lugal.igi.

Line 80: Also Ur III.

Line 81: Elsewhere the name of a goddess. The reading ^{d}nin.mú, based on CT 24 10 16-17, mistakes the professional title muḫaldim as a gloss on the second sign of the name. The reading šar is based on the identification of this deity with ^{d}nin.$^{šà.ar}$BÁRA (CT 24 1 28 = ^{d}nin.šar: 20 19), for which a great deal of circumstantial evidence exists.

Line 84: Cf. line 91?

Line 85: Ninmaš is a deity. Cf. L nin.maš.e.

Line 86: Cf. line 32 and note, also lugal.úrim^{ki}.e.ki.ág (Ur III).

Line 87: Cf. L and Ur III lugal.érin.

Line 89: Cf. Ur III lugal.ma.

Line 90: Cf. line 47.

Line 93: dingir.tuku is "be successful", cf. the Akkadian personal name *rāši-ili* (Stamm, *Namengebung*, p. 252).

Line 94: Cf. L and Ur III lugal/nin.šà.lá.tuku.

Line 98: Cf. Ur III lugal/nin.ḫa.ma.ti.

Line 110: Cf. Ur III lugal/nin.mè.(a).

Line 113: The deity (^{d})nin.LAK 256 is presumably the same as the vizier of Šamaš often read Ninpirig (J. Finkelstein, *RA* 67 [1973] 111ff.), but the signs can also be read Ninug, cf. E. Weidner, *AfK* 2 (1924-25) 12 5b: ^{d}nin.ug = *mu-*^{r}*ú*^{1}*-*[*tu*] (collated).

Line 115: Cf. Ur III lugal.ù.tu.da.

Line 118: Cf. Ur III lugal.gi.a.

Line 123: Cf. Ur III lugal/nin.ḫé.du$_{7}$.

Line 125: Cf. Ur III lugal.inim.du$_{10}$.ga, also Westenholz, Bi.Mesop. 1 p. 89: lugal.inim.du$_{10}$.(ga).

Line 127: The second sign is neither a certain AMA nor ENGUR.

Line 128: Restore: nin.uru$_{16}$.ḫa.[šu].ú[r]?

Line 129: The last sign is apparently not .d[a].

Line 130: See note on line 32. Also Ur III: Chiera, *Selected Temple Accounts from Telloh, Yokha and Drehem* (Philadelphia, 1922), 10 ii 16.

Line 131: Cf. Ur III lugal.nì.šà.a.

Line 132: Cf. L lugal.á.na and Ur III nin.e.á.na.

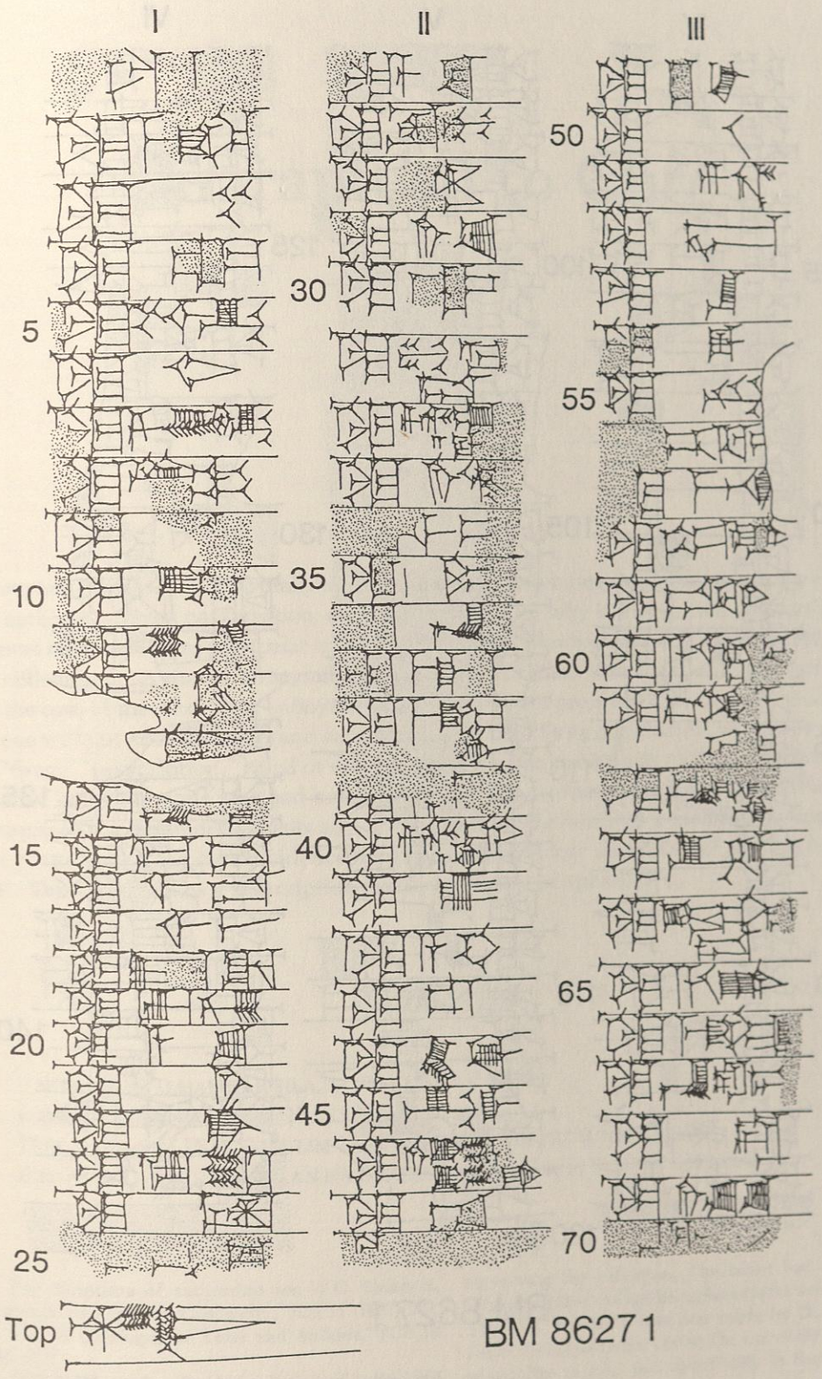
Line 134: Restore nin.t[u.da]?

Line 138: Also Ur III.

Line 139: Also Ur III, and dingir.gá.bí.du$_{11}$.

Line 141: Cf. Ur III ^{d}nin.šubur.ka "he of the lord/lady of the netherworld."

Line 143: Cf. from Nippur lugal/nin.en.nu (Westenholz, Bi.Mesop. 1, pp. 88, 95), and the Ur III lugal.en.nu/nun.



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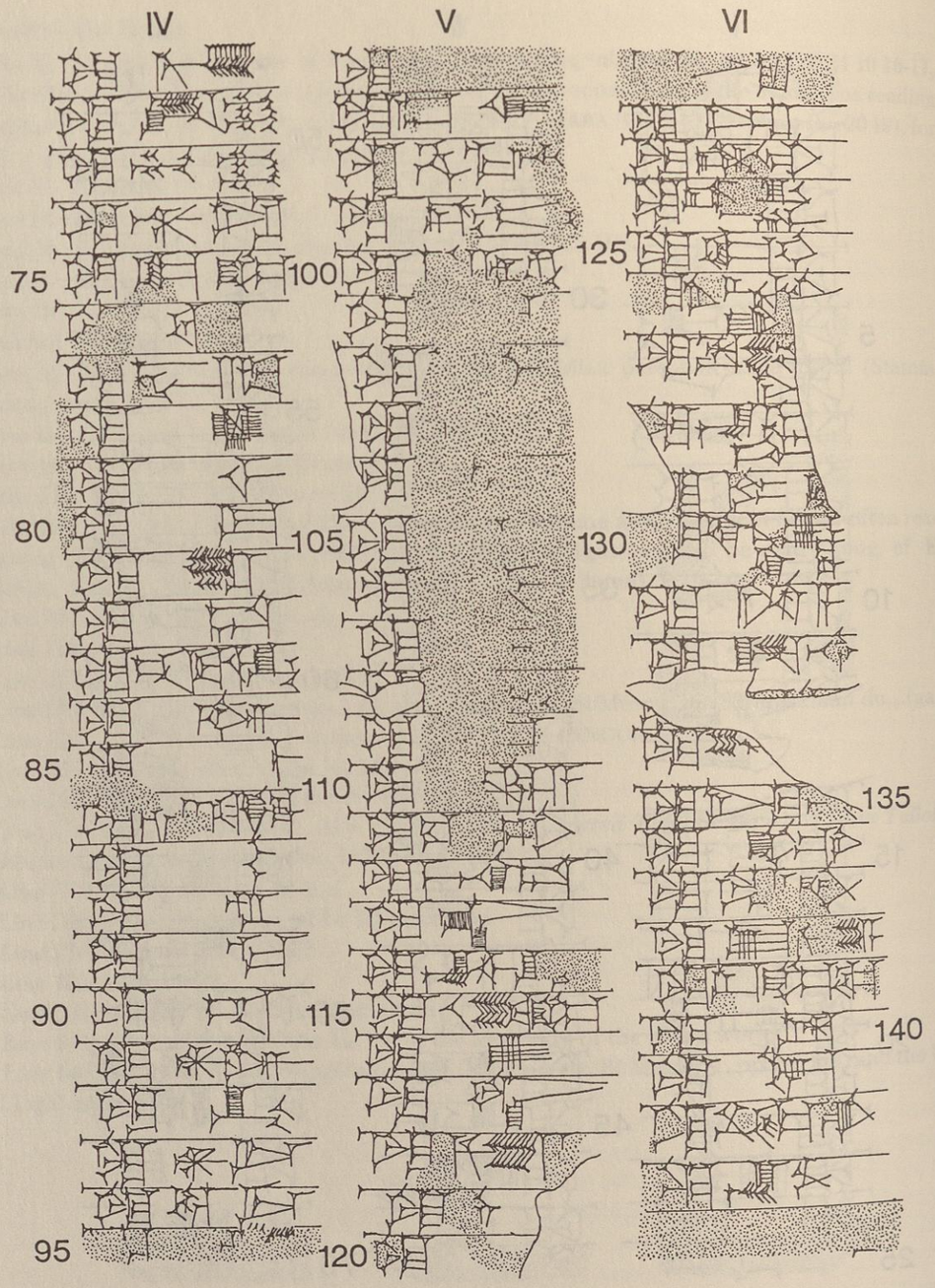

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Guaranteed to Cure

ERLE LEICHTY

In ancient Mesopotamia virtually all literature was anonymous. In most cases we have no idea who authored a given composition, or when, or where, or why it was written. Authorship does not seem to have been of particular interest to the ancient Mesopotamian; at least not until the late first millennium.[1] A similar anonymity pervaded the divinatory, medical, and religious texts.

In the case of medical texts, anonymity could well pose a problem. The Mesopotamian world was one without advertising, brand names, or a Food and Drug Administration and the efficacy of a "drug," "prescription," ritual or other medication was known only to those who had used it before or knew someone who had benefited from it. Under these circumstances one should not be surprised to find endorsements and testimonials for the worth of a medication slipped into some of the texts. One such incidence occurs in the previously unpublished[2] medical text, CBS 14161. The text contains a prescription for the treatment of aphasia.

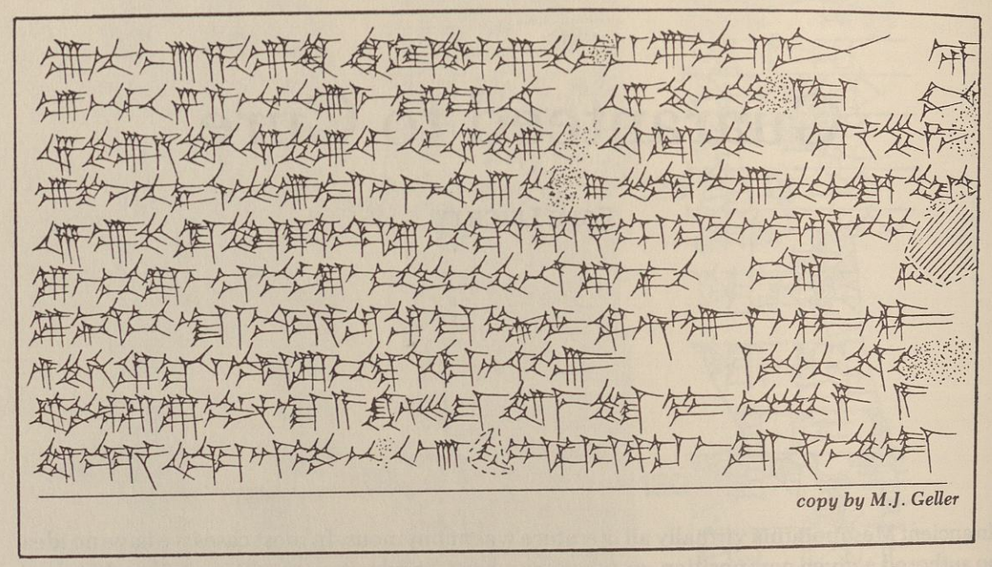
CBS 14161

Ú.NU.LUḪ.ḪA Ú.ḪAR.ḪAR $SILA_4$.SAR Ú.KUR.RA Ú *úr-ni-e*
Ú *ti-iá-a-ti* Ú *šib-bur-ra-tú* 15 ŠE MUN *a-ma-nim*
15 ŠE Ú *tar-muš* 15 ŠE Ú.IGI.LIM 15 ŠE Ú.IGI.NIŠ 1 GÍN NUMUN GIŠ.ŠINIG
Ú.IN.NU.UŠ NUMUN Ú.URU.AN.NA Ú.KUR.KUR Ú *kur-ka-nu* Ú NUMUN ŠEM.LI

1. For discussion of authorship see W.G. Lambert, "Ancestors, Authors, and Canonicity," *JCS* 11 (1957) 1ff., 112; and "A Catalogue of Texts and Authors," *JCS* 16 (1962) 59ff.

2. CBS 14161 was listed as being "missing" in the 1910 inventory of The University Museum's tablet collections. It was recently found by Dr. Pamela Gerardi while conserving the collection. The tablet had a partially effaced number and had been placed in the wrong drawer. The copy published here was made by Dr. Markham Geller during his recent visit to The University Museum. I would like to take this opportunity to thank him for undertaking this task.

CBS 14161



copy by M.J. Geller

17 Ú *lat-ku-tu ša* KA.DIB.BI.DA *ša* 7 *um-ma-nu ina* UKKIN-*šú-nu* DUG_4
lu ina KAŠ *lu ina* GIŠ.GEŠTIN *lu ina* KAŠ.LÚ.DIN.NA *lu ina* GA NAG.MEŠ
lu ta-bi-la ana KA-*šú* ŠUB.ŠUB-*ma kiš-pi ru-ḫu-ú* NÍG.KÌD.KÌD
$ZI.KU_5$.RU.DA KA.DIB.BI.DA DI.BAL-*ú ana* LÚ NU TE-*bi*
ŠÀ LÚ *šab-su il-la-a* ḪAR.MEŠ-*šu em-me-tu i-kaṣ-ṣa-a*
IM KA-*šú* UGU DINGIR LUGAL IDIM *u* NUN DÙG-*ab* SAG.PA.LAGAB *ina* SU-*šú* DU_8-*at*

nuḫurtu-plant, *ḫašû*-plant, *kasû*-plant, *nīnû*-plant, *urnû*-plant, *tijatu*-plant, *šibburatu*-plant, 15 grains of red salt, 15 grains of lupin, 15 grains of *imḫur-līmu*-plant, 15 grains of *imḫur-ešrā*-plant, 1 shekel of tamarisk seed, *maštakal*-plant, seed of uru.an.na-plant, *atāʾišu*-plant, *kurkānû*-plant, juniper seed: 17 tested plants for aphasia which the seven experts prescribed (lit. spoke) in their assembly. In beer, or wine, or innkeeper's beer, or milk, you should make (the sick man) drink (i.e. the plants). Or, you should dry (them and) strew (them) in his mouth and (neither) witchcraft, (nor) bewitchment, (nor) sorcery, (nor) "cutting of the breath", (nor) aphasia, (nor) perversion of justice will approach the man. Anger will leave the heart of the man. His hot entrails will become cool. The breath of his mouth will be sweet for god, king, noble, and prince. Grief will be released from his body.

The plants in this prescription are summed up in line nine as "17 tested (*latkūtu*) plants for aphasia which the seven experts (*ummânu*) prescribed (lit. spoke) in their assembly." The most frequent means of endorsing the effectiveness of a medication was the use of the adjective *latku* "tested." This term is used with plants, herbs, salves, poultices, and bandages. It is also said of fumigations, rituals, and general cures. Occasionally, medications are said to have been "tested" for specific diseases.

Another type of endorsement ascribed the source of the medication to "experts or "sages,"[3] using such phrases as *bulṭu ša qāt ummâni* "a tested cure from the hand of an expert" (*BAM* 303:24); *ša qāt ummâni latik bari* "tested (and) checked by the hand of an expert" (*AMT* 19,6 iv 4); *ša pî ummâni* "from the oral tradition of the experts" (Parpola, *LAS* 13 r.2); *ša sibitti ummânu ina puḫrišunu iqbu* "which the seven experts prescribed (lit. spoke) in their assembly" (above, CBS 14161:5) or, introducing a prescription, *umma Adapa apkalluma* "thus (says) Adapa, the sage" (*AMT* 52,1:2).

When the writer wanted to really impress the consumer he might emphasize the antiquity and exclusiveness of the tradition: *napšaltu takṣirānu latkūtu barûti ša ana qāti šūṣû ša pî apkallē labirūti ša lām abūbi ša ina Šuruppak šattu šanê Enlilbāni šar Isin Enlilmuballiṭ, apkal Nippuri ezbu la mudû mudâ likallim mudû la mudâ la ikallam ikkib Marduk* "tested (and) checked salves (and) bandages; extracted from before the flood, transmitted in Shuruppak in the second year of Enlilbani, king of Isin, by Enlilmuballiṭ, the sage of Nippur. May the unknowledgeable one show it to the knowledgeable one, (and) the knowledgeable not show it to the unknowledgeable one; it is a taboo of Marduk." (*AMT* 105,1 iv 21).[4]

Prescriptions that were exclusive or arcane had particular efficacy. The scribes were quick to describe potions, incantations, or medications as secret, using such phrases as: *nişirti šarrūti* "royal secret" (*AMT* 49,1:43); *nişirti ummâni* "secret of the experts" (*BAM* 315 iii 17); *nişirti āšipūti* "secret of the exorcist's craft" (*BAM* 322:9) *nişirti mašmaššu* "secret of the conjurer" (*AMT* 40,2:9) or *nişirti* [*Marduk*] "secret of Marduk" (*BAM* 248 iii 3). The scribes and diviners were also anxious to class their skills as "secret," and they employed much of the same terminology for that purpose.[5]

The most unusual endorsement of a medication that I know of is on an unpublished tablet in the British Museum which presumably came from Sippar:[6]

BM 59623

DIŠ NA ŠÀ.SI.SÁ TUK-*ma* NU TAR-*as*
GA U_8 [KU_7].KU_7 *ina* URUDU.ŠEN.TUR
$ŠEG_6$.[$ŠEG_6$] ZÌ.ŠE.SA.A
ana [IGI] [SUD]-*aḫ a-na* KU-*šú* DUB-*ak-ma*
ŠÀ.SI.SÁ *ip-tar-ra-as*
šá KA ^{m}Šu-*la-a* A-*šú šá*
^{md}AG-*mu*-SIG_5-*iq*
A ^{m}*É-gi-bi*
um-ma šá ⌜KU-*šú*⌝ *ma-ḫi-ru*
um-ma i-šal-lim

3. For discussion of the "sages" and "experts" see E. Reiner, "The Etiological Myth of the 'Seven Sages,'" *Or* NS 30 (1961) 1ff. and J. van Djik, "Die Inschriftenfunde, II. Die tontafeln aus dem *reš*-Heiligtum," UVB 18 (1962) 43ff.

4. H. Hunger, *Babylonische und assyrische Kolophone*, AOAT 2, (Kevelaer, 1968), no. 533 has taken this passage as a colophon. In fact, it is the section of the tablet just preceding the colophon.

5. Cf. *CAD* N s.v. *nişirti*.

6. I would like to thank the Trustees of the British Museum and the Keeper of Western Asiatic Antiquities, Mr. T.C. Mitchell for permission to study and publish BM 59623.

> If a man has diarrhoea and it cannot be stopped, you should boil sweet ewe's milk in a copper vessel; you should sprinkle roasted barley flour on the surface; you should pour (the mixture) in his anus. The diarrhoea will be stopped. According to Shulâ, son of Nabu-mudammiq, descendant of Egibi: "He whose anus receives (it), he will get well."

To the best of my knowledge this is the only instance in cuneiform literature of a personal testimonial for a medication. The endorser, Šulâ, was a member of the prestigious Egibi family, but nothing else is known of him. It would be very interesting to know if Šulâ was a physician, or a snake oil salesman, or at least what it was that made his endorsement of any value. If he really knew a sure cure for that traveller's curse, diarrhoea, he would have made a fortune in the modern world.

Sin-iddinam and Iškur

PIOTR MICHALOWSKI

Sources for the reign of the ninth king of the Larsa "dynasty" have become relatively plentiful of late. Since Hallo provided the last overview of texts from the reign of this king almost two decades ago[1] some of the known unpublished or unedited material has been made available and new texts have come to light. The publication here of a hitherto unavailable text from the time of this ruler provides an opportunity to bring up to date the catalog of texts that concern him, or that were written in his name or during his time. For practical reasons it will be useful to follow the order and arrangement of Hallo's catalog.

A few additions can be made to the first category of texts, labeled "Archival Sources." Nine economic documents from the Yale Babylonian collection have now been published in *YOS* 14.[2] Six tablets, discovered in Nippur, date to the last year of Sin-iddinam.[3] Further south, Girsu has also yielded new archival texts from the time of this king. A burial contained a pot with three tablets containing accounts of a certain Bur-Sin.[4] Two of these tablets (38 and 39) contain oaths by both Nur-Adad and Sin-iddinam. The second of these, no. 39, has an unknown year-name of the latter king while the first (38) is dated simply mu ^{d}en.zu-*i-din-nam* lugal. If this indeed indicates the first year of Sin-iddinam's reign, then we need not be at all surprised to find an oath by both the new and old ruler. Finally, M. Sigrist has published an economic tablet that clarifies the name of the fifth regnal year of this ruler.[5]

More numerous are the new additions to category II, the "Monumental Sources." The French excavations at Larsa have recovered two new inscriptions.[6] In addition, D. Arnaud has published fragments of four cones from the 1933 campaign, a duplicate to Sin-iddinam 6, and three new

1. William W. Hallo, "New texts from the Reign of Sin-iddinam," *JCS* 21 (1967), 95-99.
2. Stephen D. Simmons, *Early Babylonian Documents*. (New Haven, 1978), p. 29.
3. R. Marcel Sigrist, *Les sattukku dans l'Ešumesa durant la période d'Isin et Larsa* (Malibu, 1984), p. 100.
4. See D. Hansen, *Artibus Asiae* 32 (1970) fig. 17. The texts are published in Robert D. Biggs, *Inscriptions from Al-Hiba-Lagash* (Malibu, 1976), nos. 36, 38 and 39.
5. Marcel Sigrist, "Mu Malgium basig," *RA* 79 (1985) 165-68.
6. Edited in Ilmari Kärki, *Die sumerischen und akkadischen Königsinschriften der altbabylonischen Zeit I. Isin, Larsa, Uruk*, (Helsinki, 1980) [*StOr* 49] 79 as Sin-iddinam 15 and 16.

fragments.[7] New duplicates to Sin-iddinam 1-4 and 11 have been recently published by C. B. F. Walker.[8] Finally, Hallo himself has published a new duplicate to Sin-iddinam 4.[9]

In the category of canonical sources two items are to be noted. "Sin-iddinam D," a letter-prayer to Nin-isina, has now been edited by Hallo.[10] An important unpublished text of unknown provenance has been identified in the Oriental Institute, Chicago, by Miguel Civil.[11] This composition is preserved on half of a one-column tablet. It is written in the Emesal "dialect" and appears to be an address by Nin-isina to Damu on behalf of Sin-iddinam. One is severely tempted to connect this text with the letter-prayer to Nin-isina in which the king appeals to the goddess to intercede on his behalf with her healer son, the god Damu. Divine replies to letter-prayers in Akkadian are now known, and it is not inconceivable that we have here the first evidence of a similar practice in Sumerian.[12]

One of the striking facets of the sources pertaining to Sin-iddinam is the relative paucity of Nippur materials. This is a feature which he shares with other rulers of Larsa; indeed it has been suggested that Ur, rather than Nippur was the main source of literary materials dated to the Larsa rulers.[13] There is reason, however to doubt this explanation. Though the evidence is scant, it suffices to show that the Larsa kings were not totally ignored in the Nippur schools, or at least that their texts were known in that city. Gungunum is represented by two copies of a royal hymn from Nippur,[14] as well as by an Akkadian hymn of unknown provenance.[15] For Sin-iddinam, no Nippur copies of royal hymns have been located, but there are Nippur manuscripts of letter-prayers. Rim-Sin literary texts are known almost exclusively from Ur, but one unpublished fragment, N 3089, is a Nippur duplicate of *UET* 6 104; there are also Nippur copies of letter-prayers. A recently-published Akkadian literary text, on a tablet of unknown origin, mentions that king.[16]

The sources of the problem must lie in the relatively small number of texts available, rather than in the fact of the recognition of sovereignty of the Larsa kings at Nippur, for if one investigates the use of Isin and Larsa year-dates in that city and compares it to the attestation of royal literary texts it becomes clear that no such correlation can be established.[17] It is more probable that we are dealing here with a combination of two elements. The first of these may have been due to innate conservatism of the Nippur scribal school. Even in the case of Hammurabi and Samsuiluna, about whose sovereignty over Nippur there is no doubt, we have

7. Daniel Arnaud, "Textes relatifs à l'histoire de Larsa: I," *RA* 71 (1977) 5.

8. *Cuneiform Brick Inscriptions*...(London, 1981) 39-44.

9. William W. Hallo, "Choice in Sumerian," *JANES* 5 (1973) 170-171. Å. Sjöberg was preparing for publication a tablet that contains Old Babylonian Nippur copies of inscriptions of a Larsa ruler, possibly Sin-iddinam. He informs me that the tablet has now been edited by M. W. Green, who is of the opinion that the text must be ascribed to Sin-iqišam.

10. William W. Hallo, "The Royal Correspondence of Larsa: I. A Sumerian Prototype for the Prayer of Hezekiah?," AOAT 25 (1976) 209-224.

11. M. Civil kindly made a transliteration available to me. I have also had the occasion to collate the text in person.

12. Maria deJong Ellis has discovered three letters from Ištar-Kititum to the *šangû* of her temple in Ischiali and has prepared them for publication ("The Goddess Kititum Speaks to King Ibalpiel: Oracle Texts from Ischiali," M.A.R.I. 5 [1987] 235-266.). See also the later texts published by A. Kirk Grayson, "Literary Letters from Deities and Diviners: More Fragments," *JAOS* 103 (1983) 143-148.

13. W. W. Hallo, *JCS* 20 (1966) 89.

14. Published by Å. Sjöberg, *ZA* 63 (1973) 24-31.

15. Published in copy only by J. J. A. van Dijk in TIM 9 41.

16. YOS 11 24.

17. For a synopsis of Nippur year-dates of various Old Babylonian kings see R. Marcel Sigrist, "Nippur entre Isin et Larsa de Sin-iddinam à Rim-Sin," *Or*NS 46 (1977) 363-374.

relatively few Sumerian literary compositions from the city of Enlil. It may thus be that new royal hymns and similar texts were slow to enter the Nippur curriculum. Other scribal centers may have been less conservative than those in Nippur and therefore may have been more willing to adopt new texts into the curriculum.[18] The second factor would have been chance, since the relative scarcity of such texts dictates that their chances of preservation would have been smaller.

The new text presented here adds to the corpus of known Sin-iddinam inscriptions and provides still more evidence on the complex changes in literary Sumerian that are characteristic of the writings of the Larsa rulers.[19] The tablet, of unknown provenance, contains a copy of a dedicatory inscription.[20] The composition is dedicated to the storm god Iškur, who was the divine father of Sin-iddinam.[21] The text is quite wordy and literary in style, as are many Sin-iddinam inscriptions. The epithets of the deity take up thirty-one lines; I know of no other Sumerian inscription in which this is the case. Indeed, had only the first part of the text, up to the middle of the second column, been preserved, it would have been classified as a divine hymn.

The structure of the Iškur text conforms to what one expects from a dedicatory text; it is the unusual expansion of each section that gives the inscription a strong literary flavor, as do both the exceptional use, in a monumental inscription, of the "literary" name of Enki, Nudimmud (l. 42) and the way in which the epithets of the storm god are phrased, which reminds one strongly of royal and divine hymns. This unusual composition demonstrates how close some of the royal inscriptions were to the "literary" texts, particularly during the Isin-Larsa period. Another example of such congruence is the case of SRT 13, a tablet that was thought to contain copies of a Šulgi hymn (Šulgi V) and a text of an Išme-Dagan stela.[22] Recently, J. Klein has proposed that it contains copies of two hymnic inscriptions of Šulgi and Išme-Dagan,[23] while M. Civil interpreted the tablet as a single inscription of Išme-Dagan.[24]

The edition which follows represents a preliminary attempt to understand this difficult text. I have decided to provide only a basic translation, which often, I must admit, makes little sense. The text is offered here with the hope that others will be able to make more sense of it than I have so far been able to do. Difficult as this inscription may seem, it is undoubtedly simple compared to the texts that Abe Sachs devoted his life to understanding; it is presented here as a small token of appreciation for everything that he gave us.

18. Dominique Charpin, *Le clergé d'Ur au siècle d'Hammurabi* (*XIX^e-XVIII^e siècles av. J.-C.*) (Geneva-Paris, 1986), p. 302, has proposed that the Rim-Sin texts found in Ur were composed for a specific occasion and thus were not necessarily part of the broader school curriculum.

19. YBC 4624 is published by kind permission of William W. Hallo, curator of the Yale Babylonian Collection. I have also benefited from advice kindly offered by Douglas Frayne. Hallo had listed the text before as Sin-iddinam 12, "late copy of a building? inscripton to Iškur," in *JCS* 21 (1967) 96. This number was accepted by I. Kärki, *StOr* 49 (1980) 68, who left the slot empty in his edition of the OB royal inscriptions.

20. Two columns on each side; measurements: 14.4×9.2×2.5 cm.

21. See Å. Sjöberg, AOAT 25, p. 426. Note, in particular Sin-iddinam B (UET 6 99) rev. iii' 6'-7': [d]umu á nun gál ^{d}iškur-[r]a me-en.

22. Å. Sjöberg, ZA 54 (1961) 70.

23. Jacob Klein, "Šulgi and Išmedagan: Runners in the Service of the Gods (SRT 13)," *Beer-sheva* 2 (1985) 7*-38*.

24. Jacob Klein, *Beer-sheva* 2 (1985) 9*-10*.

Transliteration

Col. i:

1. ᵈišku̯r en ud piri[g. . .] / ud gal a[n-ki]
2. nam-maḫ-a-ni-šè nir-gál
3. sag-kal ka-mud-gàl / dumu an-ᵀnaᵀ
4. sag ᵀgìrᵀra gú-è-a
5. en sag ḫuš ud gal-ᵀlaᵀx-a / gaba ᵀšuᵀ-gar nu-tuku
6. dunga sír-re
7. mir-a kas_4-kas_4 x-da-ni
8. ki mu-un-da-$tuku_4$-e
9. an dagal-la im maḫ / gù ru-ru-gú
10. [za-pa]-ág-bi ḫé-ᵀgál/-àmᵀ
11. sig_{14}?(KA×X)-gi_4-ni-šè / kalam ḫur-sag gal-gal
12. ní-bi ba-an-da-ab-/gi_4
13. ur-sag gal šibir-ta šuᵀ-dab_5-e
14. nam-nir-ra zag-kéš
15. a-ab ur_5-$ša_4$-ni
16. me-<lam> kalam-ma dul-la-šè
17. na_4ᵀgal-galᵀ bàd $šeg_x$(IM.A) gil
18. x x-ba mu-un-na-/gub-bé-eš

Col ii:

19. [. . .]
20. [. . .]
21. giᵀ dim ᵀx laᵀ[. . .]
22. ní-bi gál-la-ni-šè
23. x (erasure) di ᵀmuᵀun-na-íl
24. un šár-ra-ba igi-bi / im-ši-gál
25. en nam-ḫé $giri_{17}$-zal lu-lu-/lu
26. zi kalam-ma šúm-mu
27. nun šà-gur-ru šu-$nigin_2$-bi dùg
28. an-dul larsa.ki-ᵀmaᵀ
29. á-daḫ ᵈen.zu-i-din-na-am / ki mè-ka
30. šen-šen-na $eren_2$ zag-ga-na / gub-bu
31. en gal kù-gál an / ᵈen-líl-ka
32. nam-ma-ni zag nu-di
33. lugal-a-ni-ir
34. ᵈen.zu-i-din-na-am / nita kala-ga
35. nun sun_5-na ní-tuku / ᵈen-líl-lá
36. ḫé-àm é-kur-ra-kam
37. šul mu dùg sa_4-a/ᵈnanna-ke_4
38. ú-a ᵀuri_5ᵀki.-ma

Col. iii

39. lugal larsa.ki-ma
40. lugal ki-en-gi ki-uri-ke_4

Translation

1. For Iškur, the lord, the storm, lion/panther [. . .], great storm of heaven and earth,
2. who is confident in his might,
3. foremost, divine advisor, the son of An,
4. whose head is clothed in / who is clothed in glory,
5. unrivaled, awesome chief lord, who . . . the great storm.
6. Storm cloud:
7. when he runs with the tempest,
8. the earth shakes.
9. (When) the great wind in the widespread heavens brays,
10. its noise is (a sign of) abundunce.
11. When he roars, the land (and) the great mountains
12. are afraid!
13. Great hero who holds the mace,
14. who is surrounded by authority.
15. The . . . of his shouting
16. covers the land (like?) a sheen.
17. Large hail stones . . . rain . . .
18. [x x] they set up for him.
19. [. . .]
20. [. . .]
21. . . .
22. . . .
23. . . .
24. He casts a glance at his numerous people.
25. Lord of abundance, who multiplies plenty,
26. who gives sustenance to the land,
27. merciful prince, whose *compassion* is beneficent,
28. protector of Larsa,
29. helper of Sin-iddinam at the battlefield,
30. who stands in battle with the troops at his right,
31. mighty lord, the canal-inspector of An and Enlil,
32. whose fates cannot be overturned,
33. —for his lord—
34. Sin-iddinam, mighty man,
35. the humble prince, obedient to Enlil,
36. "Yea" of the Ekur,
37. the young man to whom Nanna has given a propitious name,
38. provider of Ur,

39. king of Larsa,
40. king of Sumer and Akkad,

41. geštu$_2$ dagal igi-gál diri / šúm-ma
42. ^{d}nu-dím-mud-ke$_4$
43. bala dùg ti u$_4$ sud-rá / ḫé-gál níg nu-til-e
44. ^{d}iškur dingir-ra-ni
45. sag-e-eš-e rig$_7$-ga
46. giš.ḫur eridu.ki-ga si sá-sá
47. nindaba
48. dingir-re-e-ne šu du$_7$-du$_7$
49. gal-an-zu me libir$^{?}$
50. ⌜ki-bi⌝ bí-in-gi$_4$-a
51. [. . .]x (end of e$^{?}$) un šár-ra-ni
52. [x zi-d]é-eš
53. [mu-u]n-⌜pàd⌝da
54. [^{giš}gu-z]a maḫ
55. [. . .] me$^{?}$-dím-ta diri
56. [. . .r]a-ni-ir ⌜sè⌝-ga
57. [. . . k]ù luḫ-ḫa
58. [gal-l]e-eš aka
59. [. . .k]a an sig$_7^{?}$-ga

Four of five lines missing.

Col. iv

64. me-te nam-u$_{11}$-ru-ka-ni
65. ḫi/du$_{10}$-gál-le bí-du$_7$-a
66. šà la-la gál-la-na
67. kin-bi im-mi-in-til
68. u$_4$-bi-a ^{d}iškur dingir-ra-ni
69. giš.gu-za ka-silim-ma-ka-na
70. gal-bi dúr mi-ni-in-gar
71. u$_4$-a u$_4$ ul-lí-a aš
72. me-dím-bi im-mi-diri
73. giš.ḫur me maḫ-bi
74. ki-bi mi-ni-in-kin-kin
75. 2 am gal ki aš-⌜te⌝
76. erim$_2$ lugal-la du$_7$-d[è]
77. zi-da gáb-⌜bu⌝-[bi$^{?}$]
78. ⌜kù⌝-ta im-mi-[gar]
79. ud$^{?}$ pirig$^{?}$ x x x [. . .]
80. ḫé-gá[l] ^{d}a-n[un-na]
81. me-šè an$^{?}$-úr$^{?}$
82. mu-u[n]-na-da-su$_8$-s[u$_8$. . .]
83. alan-bi mi-ni-i[n-dím]
84. du$_{10}$-ub-ba im-mi-mi-i[n-gub]
85. [. . .] ⌜im-mi⌝-[in-. . .]
86. [. . .]
87. [. . .]
88. [. . .]

41. the one given wide wisdom and surpassing perception
42. by Nudimmud,
43. the one to whom a propitious reign and a life of long days, with unending abundance,
44. Iškur, his personal god,
45. had bestowed.
46. The one who prepares the rites of the Eridu,
47. who perfects the offerings
48. of the gods,
49. the all knowing, who restored the
50. ancient rites.
51. [. . .] of his numerous people
52. truly
53. had called / been called
54. A lofty throne
55. [. . .] surpassing in form.
56. . . .
57. with refined silver [. . .]
58. he made in good fashion
59. . . .

64. befitting his . . .,
65. suitable for . . .
66. With jubilation
67. he finished the work.
68. Then, Iškur, his god,
69. on a joyful throne,
70. greatly he seated.
71. Then, for ever,
72. he made its form surpassing,
73. the essence of its great plans and divine prototypes
74. he sought out.
75. Two great auroxes at the place of the throne
76. who attack the enemies of the king,
77. on the right and left
78. he encrusted with precious metals.
79. . . .
80. The abundance . . .the Anuna-gods,
81. . . .
82. he set them up.
83. He fashioned that statue and
84. set it upon a sockle.
85. . . .
86. [. . .]
87. [. . .]
88. [. . .]

Commentary

Line 1. Iškur is ud gál an-ki-r[a] in Sin-kašid 11:2. The broken sign after ud can be read either hu[š] or pir[ig], see ^{d}pirig-gù-du$_{11}$-ga, a name of Iškur in An=Anum III 262. Note ^{d}nanna en pirig gal an-ki in UET 1 289 30-31 but *SRT* 9:1 u$_4$ huš [ga]1 ⌜mè⌝-[a], describing Inanna.

Line 3. sag-kal = *ašaridu*. In OB royal inscriptions this word is usually found in genitive constructions such as Sin-iddinam 8:3 sag-kal an-ki; ibila sag-kal (Samsuiluna Bilingual D, Sumerian version 22-23) or appositionally: sag-kal kur gú-erim$_2$ šu-ḫul di (Rim-Sin 12:4).

The initial sign in ka-mud-gál has been read in different ways (inim, sag, KA, see Å. Sjöberg, *OrSuec* 22 [1973] 113-114), but the reading is now assured by the appearance of the word in the ka section of Proto-Sag x 15′ (MSL SS 1 9). The meaning of the word is uncertain. One reference that provides some clue is Šulgi X 50-52; šen-šen-na kuš$_7$ tukul-lá-zu me-èn unken-na ka-mud-gál-zu me-èn ḫar-ra-an zi-šà-gál-zu gá me-èn, "In combat I carry your weapon like an armour-bearer, in the assembly I am your advocate, on campaign I am your inspiration" (J. Klein, *Three Šulgi Hymns* [Ramat Gan, 1981], pp. 138-139, translation following Klein).

Line 5. One expects the seventh sign to be u$_5$, "to ride," but the traces do not point to such a reading.

Line 7. I find this line difficult; perhaps relevant is *SRT* 13:58: u$_4$-ba ^{d}iš-me-^{d}da-gan urudu.alan mir-re-e kas$_4$-kas$_4$-e ḫu-luḫ-ḫa-na é-ní-guru$_3$ bara$_2$ kal-kal-[l]a-na mu-ni-in-gub. This passage has recently been treated by D. Frayne, *JAOS* 103 (1983) 746, who translated it: "At that time, Išme-Dagan set up on his precious daises, in the temple which radiates an aura, a copper image of a fearsome slithering 'mir'." He understood mir = *šibbu*, "serpent," as opposed to Römer's interpretation in *SKIZ* 18 which opted for mir = *meḫû*, "storm." The latter interpretation was also followed by J. Klein, *Beer-sheva* 2 (1985) 24* who translated it as: "On that day Išme-Dagan erected a statue—(depicting him) as inspiring terror while running in a storm—in his terrifying house, upon its precious dais." See his comments on p. 37*

Line 8. Compare the line in a bilingual Iškur hymn, 4R 28, 2: (collated)

11. ^{d}Iškur šur-ra-na ki ši-in-ga-tuk$_4$-tuk$_4$
^{d}*adad ina e-zi-zi-šú ir-ṣi-tu*$_4$ *i-na-aš-šu*
"The earth quakes before Adad in his fury."

Line 9. For gù...ru-gú (=*nagāgu*, see Nabnītu B 231 [MSL 16 262]) in connection with Iškur see VAS 14, 40:1 ur-sag nam-ḫé-a gù ru-ru-gú. Note also the name of the storm god in An-Anum III 22:1 ^{d}lugal-gù-ru-ru-gú.

Lines 10-11. A similar sequence is found in another Iškur hymn, VAS 14, 40:5-6 za-pa-ág-gá-ni x [. . .] [sig$_{14}$]-gi$_4$-ni-šè an x x [. . .]. Note also, in a Sin-iddinam inscription: ^{d}iškur dingir sig$_{14}$-gi$_4$'-ke$_4$ zi-da gin-né-ta (J. J. van Dijk, *JCS* 19 (1965) 7:121-124 [van Dijk read dingir šid$_x$-ga-ke$_4$ in l. 123]). Note that the storm god also marches at the side of the king in the "Zimri-Lim Epic," this time at the left: *i-la-ak ad-du-um i-na šu-me-le-šu*, "March, (Ḫ)addu, at his left side!" (line 141, cited after D. Charpin, M.A.R.I. 5 [1987] 661).

I fail to understand the end of line 11: undoubtedly one could read the signs in different ways. Compare, perhaps, Ur Lament 104: ka-na-ám-mu ní-šè-a ba-ra-mu-da-ab-gi$_4$.

Line 13. If the line has been read correctly then one must question the use of the postposition -ta. One possible solution to the problem would be to assume that, as is often the case in the Sumerian of Larsa, there is a confusion of the ablative/instrumental with the locative, influenced no doubt by the syntax of Akkadian *ina*.

Line 17. For na$_4$ gal-gal see, most prominently, the description of a storm in Šulgi A, 68-69 (J. Klein, *Three Šulgi Hymns*, p. 196) na$_4$ di$_4$-di$_4$-bi na$_4$ gal-gal-bi murgu-gá dub-dab ḫé-em-mi-ib-za, "Their small hail-stones and their large hail-stones were striking at my back." Examples of IM.A, read šeg$_x$, are given by J. Klein, *Beer-sheva* 2 (1985) 17* n. 54.

Line 29. See Sin-iddinam 6 36-37: ^{d}iškur dingir-mu x á-[da]ḫ-gá-ta [x]. Note also 5R 51 iv 24: ^{d}nin-urta ur-sag gal ^{d}en-líl-lá-ke$_4$ ki mè-ka á-daḫ-zu hé-a

Line 30. Note that ^{d}lugal-šen-šen-na is a name of Iškur in An=Anum III 222.

Line 36. The unique royal epithet ḫé-àm, "Let it be," used here as a noun. I know of no other passage in which it governs a noun. The following examples demonstrate that it was considered to be a frozen form in Sumerian, with the meaning "favorable verdict," or the like: ḫé-àm nu-kúr-ru-bi ḫé-em-mi-in-eš (Enlil-diriše 117 [TCL 15:9 and dupl.]); ^{d}a-nun-na-ke$_4$-ne ḫé-àm [b]a-ni-in-ne-eš-[àm] (*STVC* 63 i 8); ^{d}mu-ul-líl-le ì-sa$_6$ ḫé-àm-bi šà-mu ba-ra-dè-en-šed$_{10}$ (Ur Lament 151=161); du$_{11}$-ga-ba šu zi bí-in-gar-re-eš-àm ḫé-àm bí-in-dug$_4$-eš-àm (Nippur Lament 244).

More instructive for our text is the usage found in Enki and Ninḫursag 172: gá-e nu-kiri$_6$ ukuš$_2$ giš.ḫašḫur [giš.ḫašḫur] ḫé-àm-šè ga-mu-ra-ab-šúm. See also Å. Sjöberg, *Studia Geo Widegren Oblata* 1 (1972) 70.

Line 42. This is the first time that an Emesal form of a divine name is attested in an early Mesopotamian royal inscription.

Line 43. See Sin-iddinam 3:16-19 a da-rí ḫé-gál níg nu-til-e uru.ki ma-da-ni-šè im-mi-in-gar-ra-a (same expression in Sin-iddinam 7 15-18, except a da-rí is replaced by a du$_{10}$).

Line 46. Sin-iddinam 2:5-7 lugal giš.ḫur uri$_5$.ki eridu.ki-ga ki-bi bí-in-gi$_4$-a

Line 58. Compare, perhaps, Abi-sare 4:2, 6′-7′: kin-gal-eš nam-kù-zu ak.

Line 64. u$_{11}$-ru is difficult; see the discussion by Å. Sjöberg, TCS 3, pp. 62-64. I know of no other occurrence of nam-u$_{11}$-ru.

Line 65. Perhaps ḫi-gál is a syllabic writing of ḫé-gál.

Line 66. For la-la gál see Å. Sjöberg, *JCS* 26 (1974) 173.

Line 69. The reading of the first sign in ka-silim-ma is not confirmed by the listing of this word in the ka section of Proto-Sag x 4′ (MSL SS 1 9).

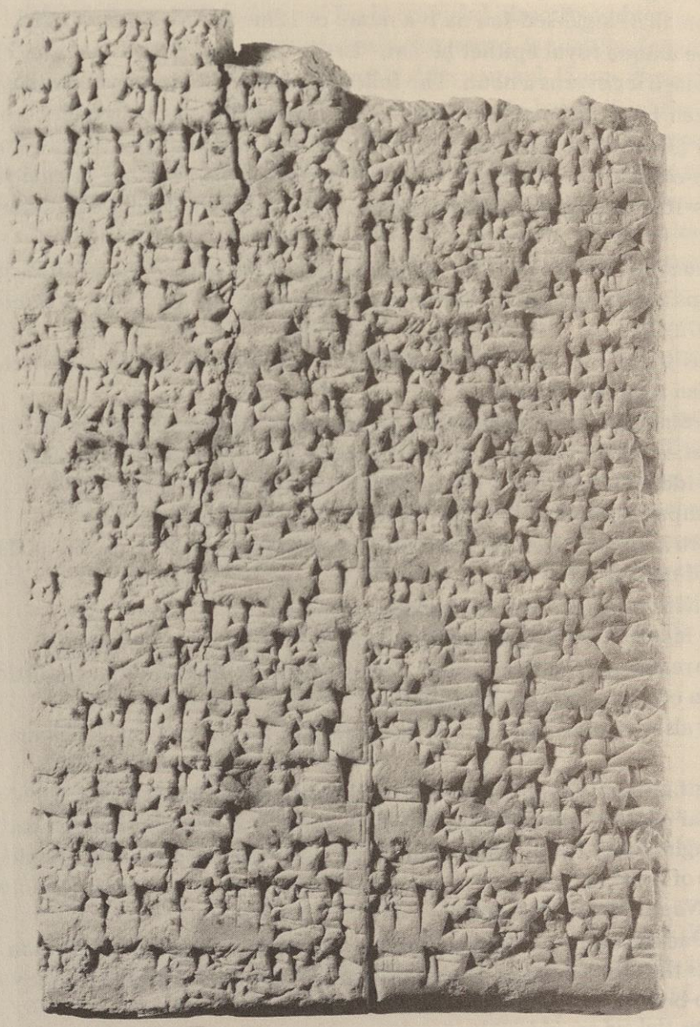
Line 70. It is also possible that Iškur is the subject of the action, that is "Iškur sat himself down . . ."

Line 72. cf. giš.gu-za me-dím-bi me-dím-ma diri-ga (Enlil-diriše 285 [UET 6:85 rev. and dupl.]), and the similar expression in Abi-sare 4 2.8′-9′: me-dím-bi me-dím-ma diri-ga.

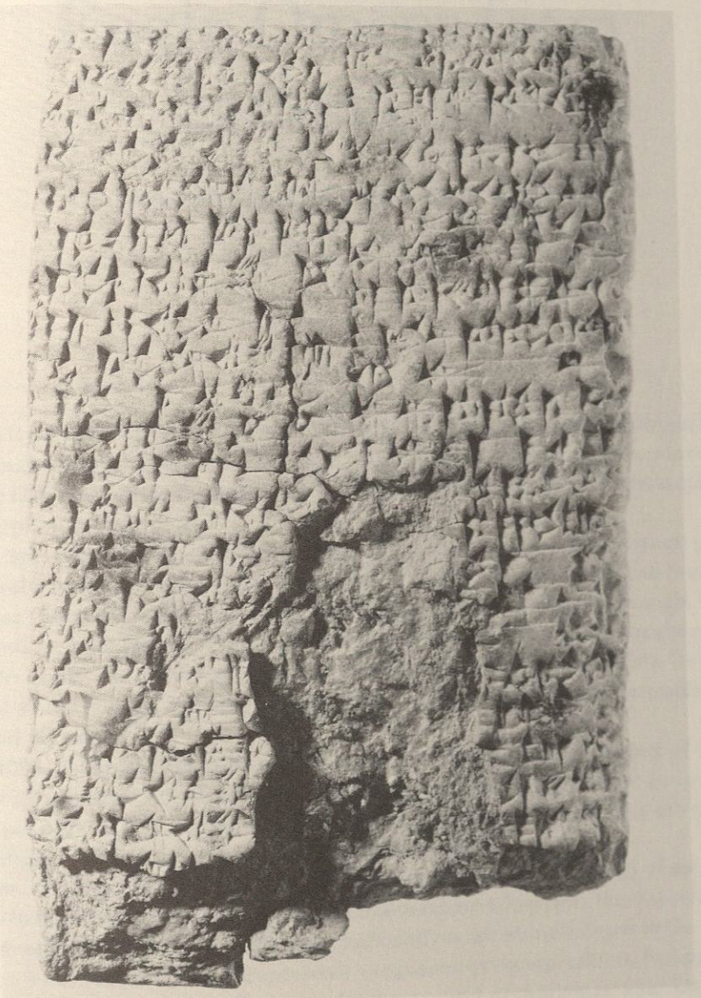
Line 79. Douglas Frayne suggests that perhaps the beginning of the line should be read as eren$_2$ pirig, "a yoke of lions" or as ERIN$_2$ + PIRIG, the animal discussed by F. Pomponio, *Annali di Istituto Orientale di Napoli* 40 (1980) 549-553.

Lines 85ff. One expects a curse upon anyone who would erase the inscription and remove the object. Unless the tablet contained an incomplete copy of the inscription, however, there does not appear to be enough space for such a curse formula.

YBC 4624, obverse



YBC 4624, reverse



Eagle Omens from Šumma Alu

SALLY MOREN AND BENJAMIN R. FOSTER

YBC 16934 is a fragment,[1] 6.5 by 4.5 cm., of the top left corner of a tablet written in Babylonian script. The fragment preserves, on the obverse, most of 16 or 17 omens on 20 lines in column i and traces of nine DIŠ's in column ii; and, on the reverse, the beginnings of 10 omens in column iii and a six-line colophon in column iv.

The tablet was originally purchased at Babylon by George N. Conklin, former professor of classics at Wesleyan University, who was reportedly told by the seller that it had been picked up near the Ishtar Gate. We would like to thank Deborah Boothby, who first brought the piece to Foster's attention, and Martha Tollefsen of Killingworth, CT, Conklin's daughter, who gave permission to study the tablet prior to its recent acquisition by Yale. Erle Leichty of the University of Pennsylvania contributed a number of helpful suggestions for readings, and Ria Ellis provided collations.

On YBC 16934 i, the omens in lines 5ff. are taken from eagles. The subject of the partially preserved omens in lines 1-3, above the ruling, is not preserved, but may be conjectured to be birds also—possibly eagles, as below; probably some other bird, as a ruling often indicates a change of subject. The topic of the omens in col. iii is pigeons.

The broken colophon identifies the tablet as omens taken from Tablet 15 of the omen series Šumma Alu. In the standard series, Tablet 15 contains omens taken from the shape of a puddle of water,[2] while omens taken from birds were included on tablets numbered in the sixties.[3] The number 15 on YBC 16934 probably represents a sequence of excerpt tablets. Perhaps the omens preserved in column i above the ruling came from one standard Alu series tablet (most likely the tablet "If eagles are extremely numerous"), those below the ruling from the next tablet, and those in column iii from a subsequent tablet.

1. Copy by Foster, study by Moren.
2. See K4041+ and 68-5-23 1 (both CT 38 21) and Rm. 456 (unpublished). For discussion, see "The Omen Series Šumma Alu," S. Moren, (unpub. Ph.D. Dissertation, University of Pennsylvania, 1978) pp. 139ff.
3. For discussion, see Moren, *Šumma Alu*, pp. 42ff. and 118ff.

Eagle omens are contained on at least two tablets of the standard series Šumma Alu, one with the first line "If eagles are extremely numerous. . .," the other, "If numerous eagles are persistently flying in front of the army during a campaign . . . ." Neither of these tablets is well preserved, and their position in the series sequence is not certain, but the following evidence suggests that they were originally numbered in the low to mid sixties.

The incipit "If eagles are extremely numerous" occurs on Sm. 1244 (CT 41 1).[4] The incipit "If numerous eagles are persistently flying in front of the army during a campaign" appears as the catchline of Sm. 1952 (CT 41 14).[5]

Sm. 1952 has now been joined by Leichty to Sm. 1376 (CT 39 25), a fragment of reverse which contains eagle omens above the catchline. One of these appears to be a duplicate of an omen from the tablet "If eagles are extremely numerous,"[6] thus establishing, at least tentatively, a sequence in which the tablet "If eagles are extremely numerous" preceded the tablet "If numerous eagles are persistently flying."

The only lines on YBC 16934 which duplicate placeable Alu omens correspond to omens from the tablet "If eagles are extremely numerous" (see i 13 and i 16-17).

The placement of the tablet "If eagles are extremely numerous" within the Alu series may be derived from Sm. 1376+1952. Though the reverse of Sm. 1376+1952 contains eagle omens, the obverse contains omens taken from aquatic creatures. The placement of the aquatic creature omens within the series is not certain, but it seems probable that they followed the omens dealing with watery habitats (Tablet 60, rivers; Tablet 61, marshes) and therefore belong to a series tablet numbered in the early sixties.

The topic of birds has already been established in the sequence by the occurrence of hawk (SÚR.DÙ, *surdû*) omens and crow ($BURU_5$.MUŠEN, *āribu*) omens on Tablets 66 and 67.[7] The tablet "If eagles are extremely numerous" may thus plausibly be assigned to a position between Tablets 61 and 66. If YBC 16934 is indeed an excerpt text of the standard series, the evidence of its column iii may indicate that pigeon omens occurred in the standard series after the eagle omens.

4. DIŠ Á.MUŠEN.MEŠ *ma-gal im-te-du* URU.BI LUGAL.MEŠ *uš-tab-ba-lu-šú* [x] [. . . UR]U.BI DIB-*bat*, "If eagles are extremely numerous (in a city), kings will despoil that city; [. . .] will seize that ci[ty]"; see also K. 9818:1 (CT 41 1) ([. . .].MUŠEN *ina* URU *im-te-du* [. . .]) and BM 65538 r. 8-9 (catchline, unpublished) ([. . . *i*]*m-ti-du* URU.BI LUGAL.MEŠ *uš-tab-ba-lu-šú* [. . . UR]U.BI DIB-*bat*.)

5. $šum_4$-*ma e-ru-ú ma-du-tu*$_4$ *ina* KASKAL UGU *um-ma-na-a-ti iš-ta-na-ḫu-ú* ŠUB-*tì um-ma-na-a-ti* GÁL-*ši*, "If numerous eagles are persistently flying in front of the army during a campaign, a defeat of the army will occur."

This omen also occurs on column ii, lines 16-21 of BM 113915, published by D. Weisberg, "An Old Babylonian Forerunner to *Šumma Alu*," *HUCA* (1969-70) pp. 87-104. On p. 96, Weisberg identifies this as "the catchline of Alu Tablet 67."

However, Sm. 1952+, on which the omen is inscribed as a catchline, is not Tablet 67. So far as I know, the identification of Tablet 67 depends on Rm. 2, 138+ (CT 39 24), which is identified in its colophon as Tablet 66 of Alu. The catchline of Rm. 2, 138+ is an omen taken from a crow observed by an army on campaign. This omen occurs as the incipit of two fragments published in CT 39 25, K.3892 and K.2898+. K.3892, which may represent the text of Tablet 67, is a fragment of obverse with no catchline preserved. K.2898+ is an excerpt tablet containing omens from several series tablets; its partially preserved catchline probably corresponds to the incipit of Tablet 69 or 70.

6. Compare Sm. 1376+1952:2 ([DIŠ] Á.MUŠEN.MEŠ *im-daḫ-ṣ*[*ú* . . .] ERÍN.NI KI DU-*k*[*u* . . .]) and Sm. 1244:10 (DIŠ Á.MU]ŠEN.MEŠ *im-daḫ-ṣu-ma a*[*na* . . .]. Also K.2911:2-3 (CT 41 1): DIŠ Á[.MUŠEN.MES *im-da*]*ḫ-ṣú-ma ana* IGI ⌜x⌝[. . . ERÍN.NI KI] DU-*ku* SAL.KAL.[GA . . .].

7. See Moren, *Šumma Alu*, pp. 211ff.

obv.

i 1. [. . .] *mi-na-ti* GAR INIM.GAR ŠUB-*di* ZÁḪ EN É É.BI BIR
i 2. [. . .-*b*]*i-iṣ-ma la it-bi* É.BI *i-lap-pi-in*
i 3. [. . .] ⌜É⌝LÚ Ù.TU 3 É.BI BIR-*aḫ*

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i 4. DIŠ Á.MUŠEN *ina ap-ti* É LÚ TU.MUŠEN *il-qí* É.BI ŠU KUR-*su*
i 5. DIŠ Á.MUŠEN *ina* ÙR É LÚ TU.MUŠEN KÚ É.BI INIM DIB-*su ina* KASKAL KUR DU-*šú zi-ta*$_5$ KÚ
i 6. DIŠ Á.MUŠEN *ina* ÙR É LÚ TU.MUŠEN *lu* MUŠEN *ma-ag-ra* KÚ-*ma* MAŠ-*šu* TAG_4-*ib*
i 7. EN E_2.BI *zi-ta*$_5$ KÚ
i 8. DIŠ Á.MUŠEN *ina* ÙR É LÚ MUŠEN *lu* 1 *lu* 2 KÚ EN É.BI *zi-ta*$_5$ *ba-il-ta*$_5$ [KÚ]
i 9. [DIŠ Á].MUŠEN *lu* UZU *lu* MUŠEN *na-ši-ma ki-ma na-šu-ú ip-pár-šam-ma ana* É LÚ ŠUB-*ut* KIMIN
i 10. [DIŠ Á].MUŠEN *ina* UGU URU.KI *iṣ-ṣa-nun-du i-šu-*ᵓ*-u* URU.BI KÚR NIGÍN-*ma* KUR-*su*
i 11. [DIŠ Á.M]UŠEN *ina* UGU URU *im-daḫ-ḫa-ṣu*$_2$*-ma im-ta-na-qú-tu-nim*
i 12. UR.MAḪ *ina* É LÚ *in-*[*na-d*]*ar*
i 13. [DIŠ A_2.]MUŠEN *ina* UGU URU *ip-ta-na-ḫu-ru-ma ina* UGU URU [X X X]
i 14. ŠUB-*tì* ERÍN.NI [. . .]
i 15. [DIŠ Á.M]UŠEN *ša-qú-ú-ma i-šu-*ᵓ*-u*$_5$ ERÍN.N[I . . .]
i 16. [DIŠ Á. MUŠEN].MEŠ *pa-aḫ-ru-ma* ZI-*ma i-du-*⌜x⌝ [. . .]
i 17. [DIŠ Á. MUŠEN].MEŠ *pa-aḫ-*[. . .]
i 18. [DIŠ Á. MUŠEN].MEŠ ⌜x⌝ [. . .]
i 19. [. . .] SAL [. . .]
i 20. [. . .] ⌜x⌝ [. . .]

ii 1-6. DIŠ.[. . .]
ii 7-8. [. . .]
ii 9-11. DIŠ.[. . .]

rev.

iii 1. DIŠ [. . .]
iii 2. DIŠ T[U.MUŠEN . . .]
iii 3-5. DIŠ TU.[MUŠEN . . .]
iii 6-10. DIŠ TU.MU[ŠEN . . .]

iv 1. [ ].ŠID.BI.IM DUB.15.KAM.MA
iv 2. [DIŠ URU *i*]-*na mu-le-e šá-kin*
iv 3. *ki-i pí-i* GABA.RI *ṭup-pi la-bi-ru ṣar-pi*
iv 4. *maš-ṭa-ar* 30-*muš-te-šir* DUMU *ga-ḫúl-*^{d}TU-TU LÚ.MAŠ.MAŠ
iv 5. ^{d}AMAR.UD-*na-di-in-aḫ-ḫe-e* DUB.SAR IN.SAR
iv 6. DUB ^{md}AG-*mu-tir-gi-mil-li* DUMU LÚ.ŠU.ḪA

obv.

i 1. [. . .] body is placed, a reputation will collapse; destruction of the owner of the house; that house will be dispersed.
i 2. [. . . li]es down and does not get up, that house will become poor.
i 3. [. . .] a person's house gives birth, (*gloss*:) 3; that house will be dispersed.

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i 4. If an eagle takes a pigeon in the window of a person's house, a hand will seize that house.
i 5. If an eagle eats a pigeon on the roof of a person's house, an order will reach that house; on the road of the country where he goes, the man will enjoy a share (of inheritance).
i 6-7. If an eagle eats a pigeon or a *magru* bird on the roof of a person's house and leaves half of it, the owner of that house will enjoy a share.
i 8. If an eagle eats a bird, either one or two, on the roof of a person's house, the owner of that house [will enjoy(?)] an usually large share.
i 9. [If an ea]gle is carrying meat or a bird and flies while carrying it and it falls (into) a person's house—ditto.
i 10. [If ea]gles are whirling about in front of a city (while) flying, an enemy will surround that city and capture it.
i 11-12. [If eag]les are fighting in front of a city and persistently falling, a lion will rage in a person's house.
i 13-14. [If ea]gles are persistently gathering in front of a city and [. . .] in front of the city—downfall of the army [. . .]
i 15. [If ea]gles are soaring up and flying, the army . . .
i 16. [If eagle]s are gathered and rising up and [. . .]
i 17. [If eagle]s are gathe[red . . .]
i 18. [If bird]s(?) [. . .]
i 19. [. . .]
i 20. [. . .]

ii 1-6. If [. . .]
ii 7-8. [. . .]
ii 9-11. If [. . .]

rev.

iii 1. If [a pigeon . . .]
iii 2-9. If a pigeon [. . .]

iv 1. [ ] numbered lines of Tablet 15,
iv 2. "[If a city] is set on a height"
iv 3. According to a copy, a fired original,
iv 4. (of a) text (belonging to) Sin-muštešir, son of Gaḫul-Marduk the exorcist;
iv 5. Marduk-nadin-ahhe the scribe wrote it.
iv 6. Tablet (belonging to) Nabu-mutir-gimilli, son of the "fisherman."

Commentary

i 4. See BM 113915 (Weisberg, *HUCA* [1969] 87ff) ii 22-26: *šum-ma e-ru i-na a-ap-tim/ a-wi-lim su-u[m-m]a-ta/ iṣ-ba-at bi-ta-am/ ša!-[a-t]i ma-ru-uṣ[sic]-tum/i-ka-ša-da-as-su.*

i 5. Compare BM 113915 iii 14-19: *šum-[ma] e-ru-[um]/i-na u_4-ur a-wi-lim/su-um-ma-ta i-ka-al-ma/[u]š-ta-ad-du-ú-šu/a-wi-lam! šu-ú/mi-im-ma ú-wa-ta-a[r]*

i 6. The reading *ma-ag-ra* is clear on the tablet. Syntax suggests that this is the name of a bird; perhaps it was a red bird whose name was related to the color *makru* listed in *CAD* M 1 138. Alternatively, this may be the adjective *magru*, "favorable," which is used in hemerological contexts to refer to favorable months or days (see *CAD* M 1 47).

i 8. *Baʾilta* appears to be an adjectival form of *baʾālu*, "to be abnormally large"; see *CAD* B 1.

i 9. Compare BM 113915 ii 27-35: *šum-ma e-ru-um/ lu nu-nam lu iṣ-ṣú-ra-am/iṣ-ba-at-ma/ip-pa-ar-ša-[am]-ma/i-na mu-uḫ-ḫu-ur/a-wi-lim i-ku-ul/a-wi-lum šu-ú/ṣi$_2$-ta-am i-im-ma-ar-a/ú-uṣ-(ṣi)-i-šu*

i 13. See Sm 1244:4 (CT 41 1): DIŠ Á.MUŠEN.MEŠ *i-na* UGU URU *ip-ta-na-ḫu-ru-ma ina* UGU URU ⌜x⌝ [. . .]

i 15. Cf. K.2911:6 (CT 41 1): DIŠ Á.[. . .]-ʾ-*ú* ERÍN.NI [ ] and K.6304:9 (unpublished): [ ]-*qu-ma i-šu-*ʾ-*ú* ERÍN.NI.

i 16. See Sm 1376:5-6 (CT 39 25) DIŠ.Á.MUŠEN.MEŠ *pa-aḫ-ru-m*[*a* . . .] ERÍN.NI KI DU-KU [. . .]

i 17. See Sm 1376:7 (CT 39 25) DIŠ.Á.MUŠEN.MEŠ *pa-ah-ru-ma ana* IGI ERÍN.NI *i-bu* [. . .]

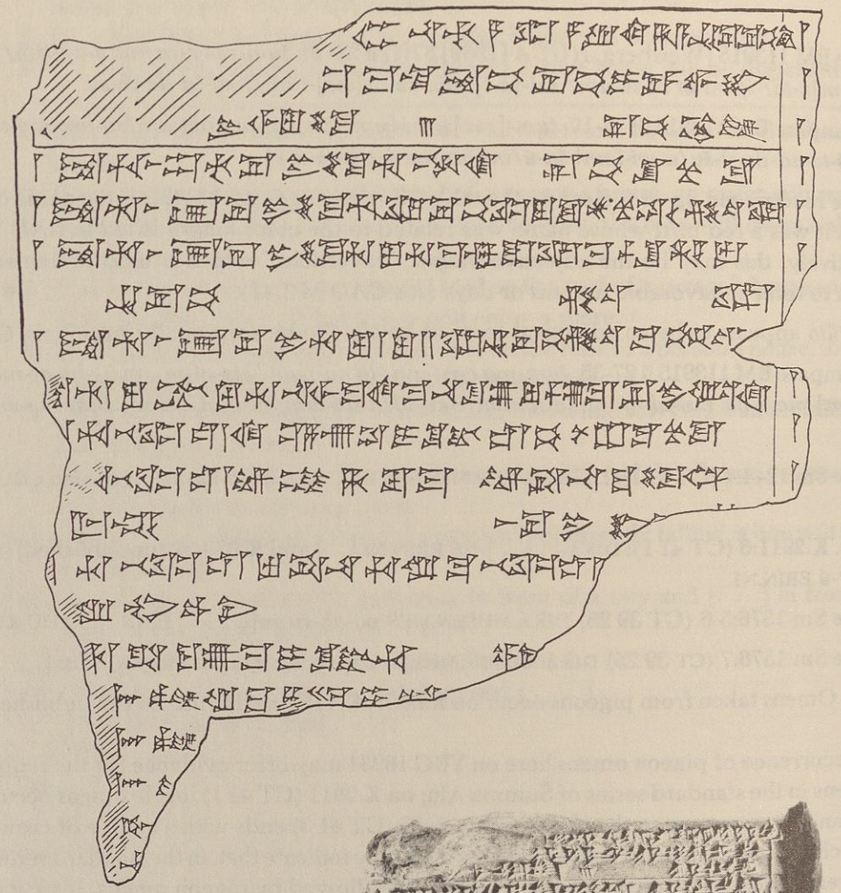
iii 1-10. Omens taken from pigeons occur on K.6801, K.7153, and Rm.2, 33 (all published in CT 41 3).

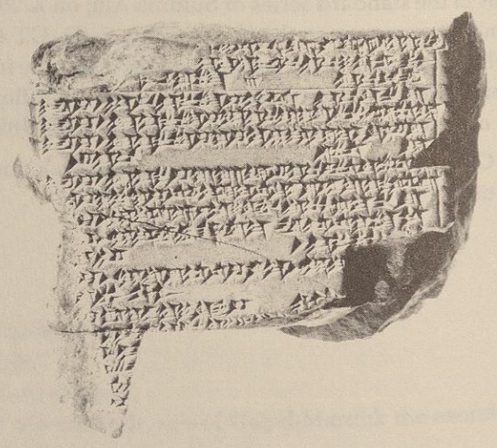
The occurrence of pigeon omens here on YBC 16934 may offer evidence for the sequence of bird omens in the standard series of Šumma Alu; on K.2911 (CT 41 1), eagle omens occur on the obverse and crow omens on the reverse. Rm. 2, 33 (CT 41 3) ends with a couple of crow omens and a catchline that consists of a pigeon omen. This may indicate that, in the standard series, eagle omens were followed by crow omens, which were followed by pigeon omens. If so, it is likely that crow omens formed the missing subject of YBC 16934 ii.

iv 2. See CT 38 12:73 for another instance of *mu-le-e* for *me-le-e* in an Alu context (though not the series title).

YBC 16934

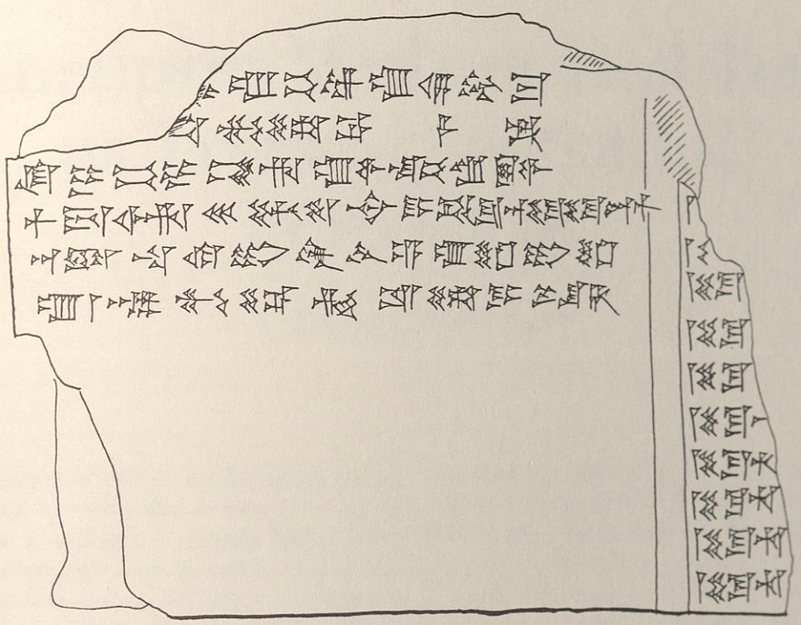
obv.





YBC 16934

rev.



Cuneiform Mathematical Texts as Training for Scribal Professions

KAREN RHEA NEMET-NEJAT

The extant cuneiform mathematical texts,[1] for the most part, belong to two distinct periods, separated by more than a thousand years: the Old Babylonian and the Seleucid periods.[2] In addition, a small group of mathematical exercise tablets from the Old Akkadian period (i.e., the Sargonic empire) form the oldest well-defined group of cuneiform documents of problem texts. Since these tablets are 500 years older than their Old Babylonian counterparts, they are important in reconstructing the history of mathematical scribal training.[3] The Old Akkadian texts will not be included in our discussion of the problem texts.

The texts themselves can be divided into three main categories: the table texts, the coefficient lists, and the problem texts.

The table texts deal with the following topics: (1) multiplication in the form of single or combined tables,[4] (2) reciprocals,[5] (3) operations with reciprocals including tables related

1. This paper is a preliminary survey based on research work in progress. It was presented at the 191st Meeting of the American Oriental Society at New Haven, Connecticut, on March 10, 1986, as a paper entitled "Cuneiform Mathematical Texts as a Reflection of Everyday Life in Mesopotamia."

I would like to express my thanks to Prof. W.W. Hallo, Curator of the Yale Babylonian Collection, for generously sharing his thoughts with me on various points of this subject and also for kindly supplying references for further study.

2. O. Neugebauer and A. Sachs, *Mathematical Cuneiform Texts*, AOS 29, p. 1; A.L. Oppenheim, *Ancient Mesopotamia* (Chicago and London, 1964), p. 306; H.W.F. Saggs, *The Greatness That Was Babylon* (New York and Toronto, 1968), p. 424f.

3. M.A. Powell, "The Antecedents of Old Babylonian Place Notation and the Early History of Babylonian Mathematics," *Historia Mathematica* 3 (1976) 417-439; R.M. Whiting, "More evidence for Sexagesimal Calculations in the Third Millennium B.C.," ZA 74 (1984) 59-66.

4. For example, *MCT*, pp. 19-33; O. Neugebauer, *Mathematische Keilschrifttexte* (Berlin, 1935-37) 1, pp. 32-67; *MKT* 2, pp. 36-37; *MKT* 3, pp. 49-50; E.M. Bruins and M. Rutten, *Textes Mathématiques de Suse*, Mémoires de la Mission Archéologique en Iran 34, text IV (=Tablet K): 35; E.M. Bruins, "Some Mathematical Texts," *Sumer* 10 (1954) IM 54536, IM 54216, IM 52548, IM 55111, IM 55292, IM 52879, 55; D. Soubeyran, "Textes mathématiques de Mari," *RA* 78 (1984) 19-28, Texts 1-3. Cf. A. Aaboe, "Two Atypical Multiplication Tables from Uruk," *JCS* 22 (1968-69) 88-91.

5. The reciprocal tables include reciprocals of standard type, of larger extent, and of regular and irregular numbers, e.g., *Late Babylonian Astronomical and Related Texts* (Providence, 1955) 1631-1637 (see 1642-1645, texts analyzing reciprocals); *MCT*, pp. 11-16; *MKT* 1, pp. 8-32; *MKT* 2, pp. 36-37; Aaboe, "Some Seleucid Mathematical Tables (Extended Reciprocals and Squares of Regular Numbers)," *JCS* 19 (1965) 79-86; P. Hulin, "A Table of Reciprocals with Sumerian Spellings," *JCS* 17 (1963) 72-76; A.J. Sachs, "Babylonian Mathematical Texts I: Reciprocals of Regular

to *mahiru* or "price equivalency" problems,[6] (4) squares and square roots and cubes and cube roots,[7] (5) exponential tables,[8] (6) logarithms,[9] (7) metrological tables (of length, area, monetary conversion and weight units)[10] and (8) varia and fragments.[11]

Two examples of multiplication tables are even known from the pre-Sargonic period: (1) VAT 12593, the oldest example of a Sumerian multiplication table, is from Shuruppak c. 2500 B.C. It is actually a table of squares in standard metrological notation.[12] (2) Another text similar to the Fara tablet is known from Bismaya (ancient Adab); it probably dates to 2400 B.C. and consists of a table of small units of length and their squares stated in standard metrological notation.[13]

Neugebauer and Sachs suggest that the table texts are older than the problem texts.[14] The systematic arrangement of the table texts makes them useful as a basic tool in learning mathematics and in solving problems. In fact, numerous standard reciprocal tables and corresponding multiplication tables have been found at different sites, attesting to the extensive use and homogeneous character of these learning devices.[15] The problem texts are exercises for more advanced students and often deal with matters of practical interest.[16] As expected, more table texts than problem texts have been found. Bruins suggests that the multiplication and reciprocal tables were prepared only for use in schools; they were not used by skilled mathematicians who were able to calculate by heart due to the flexibility of the sexagesimal system.[17] Later the development(?) of reciprocal tables with ten or more places was motivated by the growth of theoretical astronomy in the Seleucid period.[18]

Sexagesimal Numbers," *JCS* 1 (1947) 219-240; Sachs, "Babylonian Mathematical Texts II-III," *JCS* 6 (1952) 151-156. F. Thureau-Dangin, *Textes mathématiques babyloniens* (Leiden 1938) pp. x-xi. notes that *igi* "inverse" is an abbreviation from *igi-gál* "that which is opposite." Hulin, *JCS* 17 (1963) 72-76 discusses *STT* 399, a table of reciprocals in which the numbers and fractions are spelled out in Sumerian. Cf. J. Friberg, *A Survey of Publications on Sumero-Akkadian Mathematics, Metrology and Related Matters* (1854-1982) (Göteborg, Sweden: Department of Mathematics CTH-GU, 1982), p. 92f. suggests that the table of reciprocals is a table of complementary numbers whose product is equal to one.

6. For example, *MCT*, pp. 17-18.

7. For example, *LBAT* 1636, 1637 obv. 16f., 1638, 1639, 1640, 1641; *MCT*, pp. 33-35; *MKT* 1, pp. 65-77; *MKT* 3, pp. 51-52; Soubeyran, *RA* 78 (1984) 28-30, texts 4-5.

8. For example, *MKT* 1, pp. 77-79.

9. For example, *MCT*, pp. 35-36. O. Neugebauer and A. Sachs, *MCT*, p. 36 and n. 96d note that the logarithmic tables are the logical extension to the exponential tables. Unfortunately, the Old Babylonian mathematicians omitted the use of a common base and the tabulation for constant intervals, which would ultimately be needed for practical computations such as calculating interest.

10. For example, *MKT* 1, pp. 88-94; Sachs, "Two Neo-Babylonian Metrological Tables from Nippur," *JCS* 1 (1947) 67-71.

11. For example, *MCT*, p. 36; *MKT* 1, pp. 79-82.

12. A. Deimel, *Die Inschriften von Fara*, Vol. 2: *Schultexte aus Fara, in Umschrift herausgegeben und bearbeitet*, WVDOG 40 (Leipzig, 1922), no. 82; *MKT* 1, p. 91f.; Powell, *Historia Mathematica* 3 (1976) 430f. notes the smaller surface units contained on the reverse and the standard notation, together with the number of SAR in each, seems to have been memorized by the student, as later metrological texts indicate. See H.V. Hilprecht, *Mathematical, Metrological and Chronological Tablets from the Library at Nippur*, BE 20/1 (Philadelphia, 1906), nos. 39 and 40.

13. D.O. Edzard, "Eine altsumerische Rechentafel (OIP 14, 70)," in AOAT 1, pp. 101-104.

14. *MCT*, p. 1.

15. Sachs, *JCS* 1 (1947) 221.

16. Oppenheim, *Ancient Mesopotamia*, p. 329. *MCT*, p. 1.

17. E.M. Bruins, "Computation in the Old Babylonian Period," *Janus* 58 (1971) 222. On p. 240 Bruins notes that no numbers occur in the problem texts which require a reciprocal table; usually the reciprocals are of simple structure and tables need not be consulted, e.g., BM 85200 + VAT 6599.

18. *MCT*, p. 1 n. 4. According to A. Kyrala, "Speculations on Babylonian Telescopes, Planetary Distances and Sizes," *Sumer* 28 (1972) 21-28, the Babylonian excavations have yielded lenses and tablets with systematic observations of Venus from as early as the 16th century B.C. Aaboe (oral communication) disputes such an early date for the existence of lenses. Kyrala does note there is no evidence that the Babylonians had a well-developed understanding of conic sections (and trigonometry had not yet been invented); however, he suggests that the Babylonians were familiar with the circle and this simplest of closed curves formed the basis of their theory. Also, see Thureau-Dangin, "Distance entre étoiles fixes d'après une tablette de l'époque des Séleucides," *RA* 10 (1913) 215-225.

The coefficient lists offer lists of fixed values for a series of items, organized more or less by categories.[19] Like the table texts, they could be used to solve examples in the problem texts and, in fact, are cited in the calculations to the solutions of various mathematical problems. The coefficient, or *igigubbû*, may be based on definition or formula as we know it, for example, 0;5, the circumference coefficient used to calculate the area of a circle from the circumference squared is an approximation of $\frac{1}{4}\pi$[20]; or the coefficient may represent an empirical constant, as in the relation between the capacity in PI calculated from the volume in SAR by using the grain capacity coefficient, 6,0.[21] The structure of the lists is: on the left is the value of the coefficient and on the right the object to which it applies. Numbers in some lines are followed by a noun or nominal phrase while other lines show the pattern of number—*ša*—noun. When the noun directly follows the number, the number represents the actual value for the following noun; when the number is followed by *ša* and then the noun, the number represents a fixed metrological proportion between units.[22] The coefficient lists were concerned with both non-mathematical operations and mathematical ones,[23] as, for example, the appearance of a list of string names and numbers in a musical instrument, forming a catalogue of intervals,[24] may suggest. That is to say, in the tradition of lexical lists, the coefficient lists may have been padded or expanded in order to achieve the idealized form of scientific organization.[25] On the other hand, we may view these lists as underscoring the paucity of available problem texts from which to draw conclusions.[26] In fact, Haddad 104, published by F. Al-Rawi and M. Roaf as "Ten Old Babylonian Mathematical Problems from Tell Haddad, Hamrin," *Sumer* 43 (1984) 175-218[27] employs several coefficients, which up until now were mysterious entries in the coefficient lists. For example, Haddad 104 uses the value of *našpakum* "the grain capacity coefficient" (cited above) and a series of coefficients related to work with an *allum*, literally "trowel," with reference to three kinds of brickmaking operations: digging, mixing and molding.

The problem texts can be broadly divided into two categories: (1) algebraic/geometric problems and (2) practical problems, that is, problems concerned with the realia of Mesopotamian life. The boundaries are not hard and fast, and tablets may contain both categories of problems. The known corpus of problem texts includes more than 150 tablets. Of these 50% deal with purely algebraic/geometric problems and 43% with purely practical matters; the remainder are mixed. The tablets themselves may contain as few as one problem or as many as several

19. To date, our knowledge of coefficient lists is based on the following examples: (1) A 3553 [A.D. Kilmer, "Two New Lists of Key Numbers for Mathematics Operations," *Or*NS 29 (1960) 273-308 + 3 pl.]; (2) CBS 10996 [Marcelle Duchesne-Guillemin, *A Hurrian Musical Score for Ugarit: The Discovery of Mesopotamian Music*, SANE 2/2 (Malibu: Undena Publications 1984) and "Two New Lists of Key Numbers for Mathematical Operations," *Or*NS 29 (1960) 273-308 + 3 pl.]; (3) IM 49949 [Dietz Otto Edzard, *Altbabylonische Rechts- und Wirtschaftsurkunden aus Tel ed-Der im Iraq Museum, Bagdad, ABAW* NF 72. (Munich: *Verlag der Bayerischen Akademie der Wissenschaften*, 1970) no.236]; (4) IM 52301 rev. 20-22, containing a brief list of 7 coefficients and found in the middle of a problem text in [Taha Baqir, "Another Important Mathematical Text form Tell Harmal," *Sumer* 6 (1950) 130-148 + 5 pl.]; (5) IM 52916, IM 52685, IM 52304 [Albrecht Goetze, "A Mathematical Compendium from Tell Harmal," *Sumer* 7 (1951) 126-155; (6) Susa Tablet I (= Text 3) [*TMS*, pp. 25ff.] (7) YBC 5022 (published as Text Ud, *MCT*, pp. 132ff.) (8) YBC 7243 (published as Text Ue, *MCT*, pp. 136ff.)

20. For references see Kilmer, *Or*NS 29 (1960) 284, and Edzard, *Tel ed-Dēr*, text 236:1.

21. *TMS*, text III (= Tablet I):49; Edzard, *Tel ed-Dēr*, text 236:9. Note that references also occur in, problems nos. 1-5 in Haddad 104, published by F. Al-Rawi and M. Roaf, "Ten Old Babylonian Mathematical Problems from Tell Haddad, Hamrin," *Sumer* 43 (1984) 175-218.

22. *MCT*, p. 133 n. 303.

23. Kilmer, *Or*NS 29 (1960) 273.

24. Kilmer, *Or*NS 29 (1960) 278, text B, 298-300; M. Duchesne-Guillemin, *A Hurrian Musical Score from Ugarit: The Discovery of Mesopotamian Music*, SANE 2/2 (Malibu, 1984); D. Wulstan, "The Tuning of the Babylonian Harp," *Iraq* 30 (1968) 215-228.

25. W.W. Hallo, (oral communication).

26. *MCT*, p. 132.

27. "Ten Old Babylonian Mathematical Problems from Tell Haddad, Hamrin," *Sumer* 43 (1984) 175-218. This

hundred.[28] The largest proportion of tablets of both categories are one-problem texts. These findings do not include Old Akkadian texts,[29] which form their own well-defined group, nor do they include the few assorted Ur II texts.[30].

The type and content of the problem texts varies greatly. Some tablets contain only one example which gives all the details of the method of solution; others, sometimes accompanied by drawings (not to scale), give minimal information: data, sometimes interim calculation(s), and the solution. Other tablets contain the data and the solution partially worked out. At the opposite end of the spectrum, are tablets which contain hundreds of problems in very condensed form but give no answers or some answers. Between these two extremes are all sorts of intermediate types: texts with two or more problems solved in great detail and well arranged according to degree of mathematical difficulty, texts with many varied problems arranged without regard to levels of mathematical skill and texts which represent a small collection of coordinated problems.[31]

Some tables which contain a great number of problems without answers have colophons with the serial number of a tablet. The serial texts suggest some attempt at systematic learning. Unfortunately, there is no evidence for a canonical mathematical series. The same tablet number can occur on several tablets with different contents.[32] The numerical arrangement is merely for a scribe to keep various groups in order.[33]

Before we turn our attention to the practical problem texts, the subject of this paper, I would like to discuss briefly the scope of the algebraic/geometric problems. More than half the tablets deal with plane geometric figures, such as squares, triangles, trapezoids, rectangles,[34] circles,[35] and partitioned triangles and trapezoids; that is, the texts generally deal with problems of areas, not volumes. About one-quarter of these texts are accompanied by drawings (usually not to scale). Although their terminology is geometrical, the method of solution is algebraic.[36] The problems are solved, particularly in the case of rectangles and squares[37] and in one case of triangles,[38] by a series of equations with up to six unknowns[39] and even to the eighth degree.[40]

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article was kindly pointed out to me by J. Friberg prior to its publication.

28. The distribution is as follows:

Algebraic/geometric texts	
1, problem(s)	40%
2-10 "	29%
11-99 "	23%
100+ "	6%
? "	2%
Practical texts	
1, problem(s)	41%
2-10 "	36%
11-99 "	20%
100+ "	0%
? "	3%
Mixed texts	
4-10, problems	58%
11-99 "	42%

29. For example, A 5443, A 5446, Const. no. 236, Limet, *Liège*, nos. 36-39, MAD 5 112, TuM 5 65, *TSŠ* 50, 77, 188, 671, etc. N.B., Powell, *Historia Mathematica* 3 (1976) 436 n. 19 notes that A.A. Vaiman has found a number of additional mathematical texts from Fara in: Deimel, *Die Inschriften von Fara*, Vol. 3: *Wirtschaftstexte aus Fara* (Leipzig, 1924), nos. 93 and 125; *TSŠ* 50, 51, 77 (on pl. LIX), 81, 91, 188, 242, 245, 251, 260, 554, 613, 619, 648, 649, 671, 725, 748, 758, 775, 780, 828, 930 and 969; and Jestin, *Nouvelles tablettes sumériennes de Šuruppak conservées au Musée de Stamboul*, Bibliothèque archéologique et historique de l'Institut français de'archéologie d'Istanbul, 2 (Leipzig, 1937).

30. AOT 305 (= *RTC* 412).

31. *MCT*, p. 36.

32. *MCT*, p. 36.

33. *MCT*, p. 36.

34. Thureau-Dangin, "Notes assyriologiques," *RA* 31 (1934) 51f., suggests that uš sag problems should perhaps be read uš-sag "rectangle."

35. H. Lewy, "Marginal Notes on a Recent Volume of Babylonian Mathematical Texts," *JAOS* 67 (1947) 319; Bruins, "Babylone et Héron versus Euclide," *RA* 58 (1964) 177-181.

36. Aaboe, *Episodes from the Early History of Mathematics* (New York, 1964), p. 29; also, *MCT*, pp. 1, 37.

37. For example, YBC 4612 (*MCT*, p. 103f.), YBC 6492 (*MCT*, p. 105f.), VAT 7537 (*MKT* 1, p. 466f.), YBC 4715 (*MKT* 1, p. 478f.), *TMS*, text VIII (= Tablet V), 58f.

38. YBC 4696 (*MKT* 1, p. 505f.; *MKT* 2, p. 40f.).

39. YBC 4714 (*MKT* 1, p. 487f.).

40. *TMS*, text XIX (= Tablet D), 101f.

Parenthetical expressions are compounded to be added and subtracted seemingly endlessly.[41] A handful of tablets deal with such miscellaneous subjects as cube roots,[42] metrology,[43] numbers and their reciprocals.[44] Only three tablets deal with solid geometric figures[45]; one contains a set of three rectangular prisms which may, in fact, represent the foundation for a wall and a pillar,[46] and the other two show figures in broken context.[47]

In the mixed category approximately half the tablets deal with planar figures but 2 (of 12 tablets) deal with solid geometric figures.[48] Note that tabulation of information presents many problems since tablets may deal with more than one type of geometric figure. In addition, it is difficult to determine whether to categorize geometric figures such as squares and rectangles as planar geometric forms or as (series of) equations that are linear, quadratic, cubic, bi-quadratic, etc., based on the method of solution.

For the most part, solid geometric figures are only referred to in the practical problems, where they are indexed by names dealing with bricks and brickworks, excavations of canals and/or earth, and (earthwork) constructions such as walls, dams, and ramps. That is, there is no systematic terminology to describe solid geometric figures; rather, the shapes of three-dimensional figures are usually deduced from the descriptions and measurements in the problem texts. Thureau-Dangin's comment that Babylonian geometry did not rise above the level of everyday needs is apt in this regard.[49]

Now let us turn our attention to the practical problems. How, in fact, do we define this category? Practical problems are selected initially because they contain key words or concepts that reflect the realities and concerns of everyday life in Mesopotamia. A list of these key words

41. For example, VAT 7537 (*MKT* 1, p. 466f.), YBC 4715 (*MKT* 1, p. 478f.), YBC 4697 (*MKT* 1, p. 485f.; *MKT* 3, p. 60f.).

42. YBC 6295 (*MCT*, p. 42:Aa); VAT 8547 (Sachs, *JCS* 6 [1952] 153f.).

43. NCBT 1913 (*MCT*, p. 10). See, for example, Neugebauer and Sachs, "Mathematical and Metrological Texts," *JCS* 36 (1984) 246-48: tablets concerned with the calculation of the area of a square in standard area units.

44. YBC 6967 (*MCT*, p. 129f.); VAT 6505 (*MKT* 1, p. 270f.); VAT 8520 (*MKT* 1, p. 346f.); M 10 (Sachs, *JCS* 6 [1952] 152f.).

45. That is, in AO 6486 (*MKT* 1, p. 97f.) five of its seventeen problems involve a cube, and two involve planar geometric figures; and in BM 85210 (*MKT* 1, p. 219f.) one figure is fragmentary and may be either solid or planar, and one complex figure may be a truncated pyramid or square with a half circle cut out of one side.

46. NBC 7934 (*MCT*, p. 55f.).

47. CBM 12648 (*MKT* 1, p. 234f.); VAT 672 (*MKT* 1, p. 267f.).

48. See n. 45.

49. *TMB*, p. xix. J. Høyrup, *Babylonian Algebra from the Viewpoint of Geometrical Heuristics* (Roskilde, Denmark, 1984), p. 59, suggests that the siege ramp problems "constitute a bridge between the normal algebra and 'refined' geometric problems".

or concepts, in fact, gives the basic subcategories of the genre of practical problem texts. They are:

(1) bricks and brickworks
(2) canals and irrigation
(3) defenseworks
(4) other constructions, excavations and earthworks
(5) *maḫīru* "price equivalency"[50]
(6) interest
(7) commerce, i.e., buying and selling[51]
(8) inheritance or division of property
(9) clepsydra
(10) field plans
(11) herd growth[52]
(12) standard measures
(13) original quantity
(14) work other than work assignments in subcategories (2), (3), and (4)
(15) metal[53]
(16) *kiššû* "reed bundles" and *nalbantu*
(17) wall with wood on top and wood or reed (leaning) against a wall
(18) logs[54]
(19) forest and reed thicket
(20) doors
(21) bitumen or mud plaster
(22) foundation (NBC 7934, *MCT*, pp.55f.)
(23) Mari (tabular) texts[55]

Once the range of subcategories has been determined, the individual groups must be examined to establish whether the mathematical values quoted in these tablets reflect actual values as noted in the administrative and economic texts, and whether they correspond to artifacts and objects from excavations and archaeological sites (when relevant). We shall therefore analyze briefly the information presented by the problem texts in each subcategory.

50. Haddad 104, problem 6 (Al-Rawi and Roaf, *Sumer* 43 [1984] 175-218) is included in this sub-category though it does not contain the word *maḫīru* because, as Friberg has noted in private communication, the concept of price equivalency is illustrated. Also, the verb *pašāru* used in Haddad 104, problem 6 (rev. iii 33, 36-38), MLC 1842:7 (*MCT*, p. 106) and *TMS*, text XIII (= Tablet L), 82:4 is also found in VAT 6469 obv. i 5 (*MKT* 1, p. 269), and VAT 6546 obv. ii 7 (*MKT* 1, p. 269) may link the latter two texts with *maḫīru* texts; however, their fragmentary state has led us to classify them as "commerce."

Note that the meaning of *pašāru* as "to sell" is clarified by the contrasting parallel term *šâmu* "to buy" in MLC 1842: obv. 6f. (*MCT*, p. 106f.) GANBA *a-ša-am ù ki-ia ap-šu-ur* "(At what) price equivalent did I buy and how much did I sell for?" and *TMS*, text XIII (= Tablet L), 82: 3f. *ki ma-ṣí a-ša-am u ki ma-ṣí ap-šu-ur* "How much did I buy and how much did I sell?"

51. YBC 4698 (*MKT* 1, p. 513; *MKT* 3, p. 42f.) contains a series of eleven "ANŠE" equations. Thureau-Dangin, review of Neugebauer, *MKT* 3 in *RA* 34 (1937) 89f., read ANŠE as Ì-GIŠ = *šamnum* "oil," thus seeing in, problem 3 the ratio of first quality oil, *šamnum rēštûm*, to ordinary oil, *šamnum*, as 3:12, as in the Old Babylonian period. In problems 6 and 8 the ratio of grain to oil is 30:1. No satisfactory explanation has been found as yet to explain this complete series of equations dealing with the economics of commerce.

52. BM 85194, problem 31 (*MKT* 1, p. 142f.) may contain reference to a cow, *pārum*, in rev. iii 13-14.

53. This includes a Mari tabular text discussed under (23) below, Soubeyran, *RA* 78 (1984) 41f., text 8.

54. Note that VAT 8522, problem 1 (*MKT* 1, p. 367f.) deals with a cedar tree of a certain dimension and its value in silver. Following *MCT*, p. 59, we have classified VAT 8522, problem 1 as a log text since thickness in SÌLA is the common theme.

55. Soubeyran, *RA* 78 (1984) 19f., texts 6-9.

1. *Bricks and the brickworks*

Ten types of brick sizes are found in the mathematical texts.[56] The sizes are realistic. The bricks are further identified as SIG_4 = *libittu* "brick," SIG_4-ÁB = *arḫu* "half brick," and SIG_4-AL-ÙR-RA = *agurru* "kiln-burnt brick." Regardless of type, bricks are counted by the principle of 1 SAR = 12,0 (720) bricks.[57] Bricks are also converted to units of weight; again, this information is well attested outside of the mathematical texts.[58] A group of texts are concerned with the transportation of 9 60's of bricks 30 GAR[59] as well as with carrying earth and making bricks.[60] Finally, brick piles and walls are examined.[61] The piles are described as rectangular prisms or truncated pyramids.

2. *Canals and irrigation*

Irrigation was necessary for agriculture in Mesopotamia, a land where salinity was a problem from early times.[62] The maintenance of major canals was the responsibility of the kings and rulers, but cleaning and dredging accumulated silt from other canals came under local authority.[63] Accounts of dredging work on canals near Girsu, with assignments minutely detailed to meter and half meter of canal course to be dug, are found in great number from as early as 2400 B.C.[64] The parameters of the canals and branch canals in the mathematical texts are realistic.[65] A 30-day calendar month is used in computing wages and time.[66] The wages of 6 ŠE silver or 1 BÁN barley per day are actually attested for the Ur III period.[67] The work assignment or excavation output varies from 0;20 SAR at the upper level, called *šīlūtu*, to 0;10 SAR at the lower level, called DUSU (meaning "basket"), perhaps indicating that the digging at lower levels required shovelling the excavated dirt into baskets which had to be raised to the top and emptied while the workers at the upper level merely had to dig out the earth and cast it from the shovel to the ground.[68] A group of texts deals with enlarging the profile of the canal, which is represented as a rectangular prism or as a trapezoidal cross-section.[69] Finally, one problem deals with damming up a canal using a dike of two-thirds brick and one-third soil[70] and another, perhaps an idealized problem, depicts irrigating a field from a cistern.[71] No drawings of canals occur; only schemata of sorts are used twice to illustrate enlarged canals.[72]

56. *MCT*, pp. 93-94. Note Friberg, *Survey*, p. 13, suggests that CBS 12648 (*MKT* 1, pp. 234-235) deals with bricks of certain standard formats.

57. *MCT*, p. 94f.

58. YBC 7284 (*MCT*, p. 97f.).

59. YBC 10722 (*MCT*, p. 98); AO 8862, problem 5-9 (*MKT* 1, p. 108f.); YBC 4673, problems 2-4 (*MKT* 1, p. 506f.; *MKT* 3, p. 29f.); IM 54538 (Baqir, "Some More Mathematical Texts," *Sumer* 7 [1951] 28f.: no. 3).

60. AO 8862, problems 8-9 (*MKT* 1, p. 108f.); YBC 4673, problem 5 (*MKT* 1, p. 506f.; *MKT* 3, p. 29f.); see Kilmer, *OrNS* 29 (1960) A 3553, 276:35 IGI.GUB SAḪAR.ÌL. ÌL.SIG_4.DU, "coefficient: carrying earth (and) making brick."

61. AO 10822 (*MKT* 1, p. 123f.); YBC 4708 (*MKT* 1, p. 389f.); YBC 4673, problems 6-8 (*MKT* 1, p. 506f.; *MKT* 3, p. 29f.); YBC 4669, problems 10-14 (*MKT* 1, p. 514f.; *MKT* 3, p. 26f.).

62. Th. Jacobsen, *Salinity and Irrigation Agriculture in Antiquity*, Bibliotheca Mesopotamica 14 (Malibu, 1981).

63. Jacobsen, *Salinity*, p. 62.

64. Jacobsen, *Salinity*, p. 62.

65. Compare, for example, Jacobsen, *Salinity*, p. 62.

66. *MCT*, p. 84.

67. *MCT*, p. 74 n. 179. See B. Landsberger, *Die Serie ana-ittisu*, MSL 1 (Rome, 1937), tablet 6, iii 11-12.

68. *MCT*, pp. 84-86, 88. Lewy, *OrNS* 18 (1949) 48f. incorrectly analyzes the meaning of two terms and suggests that the workers were not confined to work an entire day at either the upper or lower stratum and that the daily volume represents a slice of the entire canal.

69. YBC 7164, problems 8-16 (*MCT*, p. 81f.); BM 85196, problem 15 (*MKT* 2, p. 43f.); YBC 9874 obv., problem 1 (*MCT*, p. 90f.).

70. VAT 8523 (*MKT* 1, p. 373f.).

71. YBC 4186 (*MCT*, p. 91f.); Jacobsen, *Salinity*, p. 61.

72. YBC 9874 (*MCT*, p. 90f.); BM 85196, problem 15 (*MKT* 2, p. 43f.).

3. *Defenseworks*

These problems are generally characterized by the phrase "I seized a city hostile to Marduk." The city in question was protected by a wall with a sloping, rising dam or a moat.[73] Only one problem has a drawing of concentric circles used to represent dike, ditch, and city.[74] The descriptions of defenseworks in the mathematical texts are accurate, but the measurements do not reflect reality.[75]

4. *Constructions, excavations, and earthworks*

This subcategory includes miscellaneous items such as: (1) KI-LÁ = *kalakku*, "excavation,"[76] represented—without drawings—as square-based prisms, rectangular prisms, and truncated pyramids, usually having a work assignment of 0;10 SAR-volume of excavation and wages of 6 ŠE silver or 10 SÌLA of barley.[77] (2) *arammu* "ramp before a city gate"; work assignment of 0;10 SAR and only one drawing.[78] For (3) *tamlâtu* "dam" all figures are triangular prisms with lateral planes that are not parallel;[79] there are no drawings for both the ramp and the dam, and an incorrect formula is used to find the volume. Both (4) *kikurru* "chapel or cult socle," a prismatic volume,[80] and (5) BÁD = *dūru* "(city) wall," a trapezoidal cross-section,[81] again use the excavation work assignment of 0;10 SAR and contain no drawings. (6) *ḫirītu* "moat, ditch," is depicted as an inverted truncated pyramid of square base with no drawing.[82] (7) *pitiqtu* "wall of rammed earth,"[83] uses a daily work assignment of 0;3,45 SAR, volume which also occurs in the coefficient lists.[84] Once again there is no drawing. (8) E = *iku* "dike" and E-LIBIR-RA "old dike" are not drawn.[85] (9) KI-SÁ = *kisû* "abutment or platform"[86] protected by a spur of land to create a triangular (underwater) prism is depicted as a triangle.[87] The measurements used may be describing a part or a whole of each construction or excavation.

73. BM 85194, problems 4, 25, and 26 (*MKT* 1, p. 142f.); BM 85210, problems 1-7 (*MKT* 1, p. 219f.). Thureau-Dangin, review of Neugebauer, *MKT* 1 and 2 in *RA* 33 (1936) 55-62, saw BM 85210, problems 1-4 as variants of BM 85194, problems 25 and 26.

74. BM 85194, problem 4 (*MKT* 1, p. 142f.). Cf. Bohl Coll., problem 1821 (Kilmer, "The Use of Akkadian *dkš* in Old Babylonian Geometry Texts," in *Studies Oppenheim* [Chicago, 1964], p. 142f., and W.F. Leemans and E.M. Bruins, "Un texte vieux-babylonien concernant des cercles concentriques," CRRAI 2 [1951], pp. 31-35): a series of concentric circles are drawn to indicate a new city ringed around an old city, perhaps, to increase the residential area. Cf. Powell, "Merodach-Baladan at Dur-Jakin," *JCS* 34 (1982) 59-61.

75. For example, D. Oates, "Walled Cities in Northern Mesopotamia in the Mari Period," MARI 4 (1985) 585-94.

76. See *MCT*, p. 65f. for discussion of this term.

77. YBC 5037 (*MCT*, p. 59f.); a series of texts containing 31, problems: YBC 4657 (*MCT*, p. 66f.), YBC 4663 (*MCT*, p. 69f.) and YBC 4662 (*MCT*, p. 71f.); YBC 8588 (*MCT*, p. 75f.); *TMS*, text XXIV (= Tablet W), 117f. Note *TMS*, text XXIV (= Tablet W) is of particular interest because it represents the earliest documented case of the use of the separation sign (GAM) for medial zero (Friberg, *Survey*, p. 90).

78. BM 85194, problem 1 (*MKT* 1, p. 142f.); Strssbg 362, problem 6 (*MKT* 1, p. 239f.); and BM 85196, problem 17 (*MKT* 2, p. 43f.) in which the *arammu* is depicted as a twice-partitioned trapezoid.

79. BM 85196, problems 3 and 4 (*MKT* 2, p. 43f.); note the scribal shorthand of dividing by 2 rather than multiplying by 0;30, the former clearly an easier operation.

80. BM 85194, problems 2 and 3 (*MKT* 1, p. 142f.).

81. BM 85194, problems 5, 17, and 18 (*MKT* 1, p. 142f.). Note BÁD = *dūru* is also found in relation to the defenseworks of a city; see n. 73.

82. BM 85194, problem 28 (*MKT* 1, p. 142f.). *ḫirītu* is also mentioned in BM 85194, problem 4 (*MKT* 1, p. 142f.) in connection with the defenseworks of a city.

83. IM 53961, problem 4 (Baqir, *Sumer* 7 [1951] 28f.); IM 54011, problems 10 and 11 (*Sumer* 7 [1951] 28f.); YBC 4673, problems 9-12 (*MKT* 1, p. 506f.; *MKT* 3, p. 29f.).

84. YBC 5022:17 (*MCT*, p. 132f.); YBC 7243:13 (*MCT*, p. 136f.); Baqir, *Sumer* 6 (1950) 134:21; *TMS*, text III (= Tablet I) 27:43; Edzard, *Tel ed-Dēr*, text 236:13 and in the problem texts themselves (see n. 83).

85. YBC 4673, problems 13-15 (*MKT* 1, p. 506f.; *MKT* 3, p. 29f.).

86. S. Dunham, "Bricks for the Temples of Šara and Ninurra," *RA* 76 (1982) 38f.

87. BM 85196, problem 1 (*MKT* 2, p. 43f.); see Thureau-Dangin, "La mesure des volumes d'après une tablette inédite du British Museum," *RA* 32 (1935) 5. For discussion of drawing see Vaiman, *Istoriko-matematiceskie issledovaniya* 13 (1960) 379-82.

5. *maḫīru*, "price eqivalency"

These texts deal with the quantity of goods which can be bought for a unit weight of silver or the weight of silver necessary to purchase a unit quantity of goods.[88] Items mentioned in these texts include barley, fat, and oil,[89] but the prices do not correspond to economic texts of the same period.[90]

6. *Interest*

These tablets[91] illustrate the interest rate, *ṣibtu*,[92] which is generally 12 shekels per mina per year, or 20%.[93] Interest is calculated so that the capital doubles every 5 years.[94] A 360-day calendar year is used for convenience.[95] Interest is repaid at the end of the year. The problems reflect both

88. *MCT*, p. 106f. J. Friberg, in discussing these texts with me, suggested the possibility that the following texts may be price equivalency texts even though they do not contain the word *maḫīru*: (a) YBC 9856 (*MCT*, p. 99f.) by reading PI-*a* = BA-RÍ-GA = *pars/šiktu* "basket." [However, note the occurrence in this text of *iš-ka-ra-am* "work assignment," which usually occurs in problems dealing with constructions or canals; in the latter case, DUSU is used to indicate "basket" in reference to the work assignment. See discussion above under (2) Canals and irrigation. I have therefore classified this text under the category (14) Work.] (b) VAT 6469 (*MKT* 1, p. 268f.), a fragment containing the word *nēmelu* "profit," which I have classified under the category (7) Commerce. (c) Haddad 104, problem 6 (Al-Rawi and Roaf, *Sumer* 43 [1984], 175-218) in which 2 GUR grain is obtained when equal numbers of 3 containers (*parsikātum*) are sold at different prices, costing 1 *parsiktum*, 5 BÁN and 4 BÁN; the text asks for how much does each sell? Finally to this list must be added (d) *TMS*, text XIII (= Tablet L), 82f., which involves buying and selling a given quantity of oil.

J. Friberg has also suggested to me that in YBC 4698, problem 14 (*MKT* 1, p. 513f.; *MKT* 3, p. 42f.) the counting 1, 2, 3, . . . 9 really represent sixties, problem 15 involves baskets of fish (see A. Salonen, *Die Hausgeräte der alten Mesopotamier nach sumerisch-akkadischen Quellen* 2, AASF B 144 [Helsinki, 1966], 278), and, of course, problem 16 deals with the commercial commodities lead and silver.

89. MLC 1842 (*MCT*, p. 106f.): barley; IM 54464 (Baqir, *Sumer* 7 [1951] 28f.: no. 9): fat (*naḫû*) and oil (*šamnu*); VAT 7530 (*MKT* 1, p. 287f.); Strssbg 362, problem 2 (*MKT*, 1 p. 239f.), YBC 4698, problem 14-16 (*MKT* 1, p. 513; *MKT* 3, p. 42f.) (see n. 88); *TMS*, text XIII (= Tablet L), 82f. (see n. 88); Haddad 104, problem 6 (Al-Rawi and Roaf, *Sumer* 43 [1984], 175-218) (see n. 88). Powell, "Late Babylonian Surface Mensuration," *AfO* 31 (1984) 41 n. 28, notes no evidence for distinct liquid and dry standards of measurement.

90. See W. Schwenzer, *Zum altbabylonischen Wirtschaftsleben: Studien über Wirtschaftsbetrieb, Preise, Darlehen und Agrarverhältnisse*, *MVAG* 19/2 (Leipzig, 1915).

91. VAT 8521 (*MKT* 1, p. 351f.); VAT 8528 (*MKT* 1, p. 353f.); YBC 4698, problems 1, 2 (*MKT* 1, p. 513; *MKT* 3, p. 42f.); YBC 4669, problem B11 (*MKT* 1, p. 514f.; *MKT* 3, p. 26f.); AO 6770, problem 2 (*MKT* 2, p. 37f.; *MKT* 3, p. 62f.); *TMS*, text XXII (= Tablet Q), 111f.

92. *ḫubullu* is found only one time in VAT 8528, rev. i 10 (*MKT* 1, p. 353f.) in the problem texts dealing with interest.

93. An interest rate of 12 shekels per mina per year or 20% is illustrated by VAT 8521 (*MKT* 1, p. 351f.); VAT 8528, problem 1 (*MKT* 1, p. 353f.); YBC 4698, problem 1 (*MKT* 1, p. 513; *MKT* 3, p. 42f.); YBC 4669, problem B11 (*MKT* 1, p. 514f.; *MKT* 3, p. 26f.); AO 6770, problem 2 (*MKT* 2, p. 37f.; *MKT* 3, p. 62f.). The rate on borrowing grain is the customary 12% in VAT 8528, problem 2 (*MKT* 1, p. 353f.). Thureau-Dangin, "Textes mathématiques babyloniens," *RA* 33 (1936) 70, discussed the method of solution in this problem as a summary of a decreasing arithmetic progression comprising six terms, the first being the interest in *sutu* per year and the last, interest in *sutu* per day. In YBC 4698, problem 2 (*MKT* 1, p. 513; *MKT* 3, p. 42f.) the interest rate is 33⅓%.

94. VAT 8521 (*MKT* 1, p. 351f.) and VAT 8528 (*MKT* 1, p. 353f.) deal with interest problems that stand between the table texts and the problem texts. The rate of interest is 12 shekels per mina per year, or 20%; compound interest is calculated so that the capital doubles every five years (see VAT 8528, problem 1 obv. i 12-13 [*MKT* 1, p. 353f.]). Compare *TMS*, text XXII (= Tablet Q), 111f., in which a three-year period is used to amortize a debt by annual payments.

95. VAT 8528, problem 2 (*MKT* 1, p. 353f.); see discussion *MKT* 1, p. 360; AO 6770 (*MKT* 2, p. 37f.; *MKT* 2, p. 62f.).

the use and non-use of tables in calculating interest,[96] but the Babylonian mathematicians omitted the selection of a common base and the tabulation for constant intervals.[97]

7. *Commerce* (buying and selling)

This category includes texts that are either broken or fraught with textual difficulties because they contain as "givens" terms and conventions of economics not further explained.[98]

8. *Inheritance or division of property*

These problems contain arithmetic progressions[99] and partitioned trapezoids.[100] Money of the order of 1 *ma-na*[101] is divided, as are fields[102] and, in one case, fiefs, characterized by the phrase "show each soldier his stake."[103] Generally, 2 to 10 people receive shares. The smallness of the inheritance often makes property division problems seem theoretical, but administrative texts of the period document such quantities in the division of property.[104]

96. Friberg, *Survey*, p. 52f., summarizes Bortolotti's argument that no sign of the use of logarithmic tables is evident in VAT 8521 (*MKT* 1, p. 351f.) and VAT 8528 (*MKT* 1, p. 353f.). Thureau-Dangin, *RA* 33 (1936) 68, agreed that the long-winded method of calculating the interest rate in VAT 8528, problem 1 (*MKT* 1, p. 353f.) by 1, 5, 10, 15, 20, 25, and 30 years suggests that the scribe did not have a table of powers at his disposal. The scribe-calculator notes that the sum of interest (payments) in five years is equal to the capital. Thureau-Dangin further indicated that the term *ba-si* refers to a system of logarithms with base 2 in this text. (Logarithmic tables would, of course, be useful in calculating interest; see n. 9.) However, in AO 6770 (*MKT* 2, p. 37f.; *MKT* 3, p. 62f.) the answer is not completely worked out, and a linear interpolation with an interest table seems indicated. The answer is an interval between three and four years, with 2;33,20 months subtracted from four years.

97. *MCT*, p. 36 and n. 96d.

98. VAT 6469 (*MKT* 1, p. 268f.) and VAT 6546 (*MKT* 1, p. 268f.) are both fragmentary with the word *nēmelu* occurring (see nn. 50, 88). YBC 4698 (*MKT* 1, p. 513f.; *MKT* 3, p. 42f.) contains seventeen problems dealing with grain, silver, and rate of interest. Most problems deal with corresponding values. Problems 3-13 use the ideogram ANŠE = *imeru* = 100 QA; however, this meaning does not elucidate the text. Neugebauer, *MKT* 3, p. 43, suggests ANŠE may mean any weight like NA_4 = *abnu*. Thureau-Dangin, *RA* 34 (1937) 89f., discussed this problem with no satisfactory result (see n. 51). Problems 4 and 5 note DUG, a dry measure of 20 or 30 QA with a gold price to iron price of 10:1. Neugebauer, *MKT* 3, p. 44, notes that according to Schwenzer, *Wirtschaftsleben*, p. 31, gold was not a medium of exchange during the time of Hammurapi and was used only for ornamental ware. By working through the correspondence, Neugebauer finds the ratio of gold to iron as 48:1 or 24:1.

99. YBC 9856 (*MCT*, p. 99f.); IM 31210 (Bruins, *Sumer* 10 [1954] 55f.); Strssbg 362 (*MKT* 1, p. 239f.); VAT 6597 (*MKT* 1, p. 274f.).

100. YBC 4608 (*MCT*, p. 49f.); AO 17264 (*MKT* 1, p. 126f.); *TMS*, text XXVI (= Tablet X), 124f.

101. 1 *ma-na* is divided (that is, the answers add up to 1) in YBC 9856 (*MCT*, p. 99f.), IM 31210, problem 5 (Bruins, *Sumer* 10 [1954] 55f.), VAT 6597, problem 4 (*MKT* 1, p. 274f.); *TMS*, text X (= Tablet G), 69f. In VAT 8522, problem 2 (*MKT* 1, p. 367f.) 1 *ma-na* is divided by the factoring of irregular numbers. Money of the order of 1 *ma-na* is divided in IM 31210, problems 2, 4, 6, and 7 (Bruins, *Sumer* 10 [1954] 55f.); Strssbg 362 (*MKT* 1, p. 239f.); VAT 6597, problem (*MKT* 1, p. 274f.).

102. See n. 100.

103. VAT 7531 (*MKT* 1, p. 289f.) and VAT 7621 (*MKT* 1, p. 290f.) concern soldiers and their stakes and deal with fiefs; these, problems are characterized by the expression *sikkassu kullimšu* "show him (i.e., each soldier) his stake" (as translated by Thureau-Dangin in *TMB*, 98f., with explanation in p. 98 n. 4).

104. F. R. Kraus, "Von Altmesopotamischen Erbrecht," in *Essays on Oriental Laws of Succession*, Studia et Documenta 9 (Leiden, 1969), p. 7.

9. *Clepsydra*

In the form of a cylinder or prism the clepsydra is used for measuring time by the volume of the water flow.[105] The mathematical texts corroborate and complement outside evidence.[106]

10. *Field plans*

Some scribes were involved in field surveys. The land registrar, *šassuku*, belonged to the educated classes of the Old Babylonian period. He might work under a high administrative official (*zazakku*), who was listed high up in the hierarchy of scribes. The *šassuku* was primarily concerned with assessing taxes on real estate, but was also engaged in survey work. If he was a geometer, he might work with a measuring rope or rods of different lengths.[107] In one of the compositions depicting school life, "The Disputation between Enkimansi and Girinishag," one student taunts another with "You go to divide up an estate but are unable to divide up the estate. For when you go to survey the field, you cannot hold the measuring line. You cannot hold a nail in your hand."[108] Evidence of surveying techniques is shown in seven mathematical tablets in which a broken reed is used to measure a field.[109] The fields depicted in the problem texts are triangles, trapezoids, rectangles, squares, and circles; with the exception of squares and circles, this accords with economic and administrative documents.[110] Some fields are measured in KÙŠ, which is then converted to a seed-barley or secondary measurement.[111]

11. *Herd growth*

These texts show a high growth rate of 70% to 80%,[112] which is not in accord with the low production rate characteristic of Mesopotamia in the third millennium B.C.[113]

105. Thureau-Dangin, "La clepsydre chez les Babyloniens," *RA* 29 (1932) 133-35; "Clepsydre babylonienne et clepsydre égyptienne," *RA* 30 (1933) 51-52; "La clepsydre babylonienne," *RA* 34 (1937) 144.

106. BM 85194, problems 6-8 (*MKT* 1, p. 142f.); BM 85210, problem 13 (*MKT* 1, p. 219f.); Neugebauer, "The Water Clock in Babylonian Astronomy," *Isis* 37 (1947) 37-43.

107. D.J. Wiseman, "A Babylonian Architect," *AnSt* 22 (1972) 146f. Powell, *AfO* 31 (1984) 36, suggests that ropes may have been avoided in measuring valuable, developed real estate because they stretch; he notes that in more recent times the chain measure has replaced the rope.

108. S.N. Kramer, *The Sumerians: Their History, Culture, and Character* (Chicago, 1963), p. 241f.; C.J. Gadd, *Teachers and Students in the Oldest Schools* (London, 1956), p. 30f.

Powell, *AfO* 31 (1984) 36 n. 17, notes that the evidence for the mechanics of surveying is sparse; the *terminus technicus* KAK . . . DÙ in third-millennium real estate sales may have reflected, initially, the practice of driving in a peg (to hold the measuring line) and, later, the ceremonial aspect of embedding a clay peg with the recorded sale in the house wall.

109. IM 53965 (Baqir, *Sumer* 7 [1951] 28f.: problem 7); Strssbg 362, problem 5 (*MKT* 1, p. 239f.); Strssbg 366, problem 4 (*MKT* 1, p. 257f.); VAT 7532 (*MKT* 1, p. 294f.); VAT 7535, problems 1-3 (*MKT* 1, p. 303f.); Strssbg 368 (*MKT* 1, p. 311f.); AO 6770, problem 5 (*MKT* 2, p. 37f.; *MKT* 3, p. 62f.). Cf. IM 52916, Goetze, *Sumer* 7 (1951) 126-155.

110. K.R. Nemet-Nejat, *Late Babylonian Field Plans in the British Museum*, Studia Pohl, Series Maior 11 (Rome, 1982), pp. 14f., 278f. Note field plans are drawn only in VAT 7532 (*MKT* 1, p. 294f.) and VAT 7535 (*MKT* 1, p. 303f.); in both cases the fields are depicted as trapezoids.

111. VAT 7848, problems 1, 3 (*MCT*, p. 141f.) and AO 6484, problems 5, 7 (*MKT* 1, p. 96f.) transform the areas into SÌLA and ŠE.MEŠ, respectively. Nemet-Nejat, *Field Plans*; *MCT*, 143f.

112. YBC 7326 (*MCT*, p. 130f.); YBC 7273 (*MCT*, p. 131); YBC 4669, problems B7, B8 (*MKT* 1, p. 514f.; *MKT* 3, p. 26f.); VAT 8522, problem 3 (*MKT* 1, p. 367f.; see *MCT*, p. 131 n. 295l). K.8705 (*MCT*, p. 140), which mentions *immeru* "ram," is fragmentary like BM 85194, problem 31 (*MKT* 1, p. 142f.).

113. I.J. Gelb, "Growth of a Herd of Cattle in Ten Years," *JCS* 21 (1967) 64-69.

12. *Standard measuring vessels*

All kinds of liquids and solids, particularly barley, were measured with measuring vessels. The vessels ranged from a small container of one-fifteenth SÌLA to large tubs used for measuring hundreds of SÌLA. The customary measuring vessels contained 1 to 10 SÌLA.[114] However, the mass production of 1 SÌLA vessels far exceeded other sizes.[115] The measuring vessels described in our texts are GIŠ.BA-AN or 1 *sūtu* vessel, GIŠ.BA-RÍ-GA = *parsiktu*, GIŠ.SÌLA = *qûm*, GIŠ.NINDA = *akalu* and GI.GUR = *pānu*.[116] The shapes can be inferred to be square-based prisms.[117]

13. *Original quantity*

These problems deal with objects from everyday life such as stone weights, hoes, barley containers, rations, and reeds in order to teach linear equations with one unknown[118]; sometimes complex parenthetical expressions are added and subtracted.[119]

14. *Work*

This term refers to a miscellaneous group of problems not including those that deal with work on canals, excavations, and other constructions. The topics include parts of a work day,[120] length of time to weave a piece of cloth,[121] manufacture of new rope,[122] amount of man-days necessary to transport sheaves a given distance,[123] parts of a day spent in demolition and transportation,[124]

114. Salonen, *Hausgeräte* 2, p. 278.

115. Gelb, "Measures of Dry and Liquid Capacity," *JAOS* 102 (1982) 585-90.

116. GIŠ.BA-RÍ-GA in BM 85194, problem 22 (*MKT* 1, p. 142f.); YBC 4669, problems 1, B9 (*MKT* 1, p. 514f.; *MKT* 3, p. 26f.). GIŠ-BA-AN/BÁN in BM 85194, problem 24 (*MKT*, p. 1 142f.); YBC 4669, problems 2, 3 (*MKT* 1, p. 514f.; *MKT* 3, p. 26f.); Haddad 104, problem 5 (Al-Rawi and Roaf, *Sumer* 43 [1984], 175-218). GIŠ.SÌLA in Haddad 104, problem 4. GIŠ.NINDA in YBC 4669, problems 4-9 (*MKT* 1, p. 514f.; *MKT* 3, p. 26f.). GI.GUR "basket," may have been used to collect barley or to collect taxes in BM 85196, problem 14 (*MKT* 2, p. 43f.).

117. Salonen, *Hausgeräte* 2, pp. 273-274. BM 85194, problems 22 and 24 (*MKT* 1, p. 142f.) and YBC 4669, problems 1-9 (*MKT* 1, p. 514f.; *MKT* 3, p. 26f.) appear to be square-based prisms because as Neugebauer, *MKT* 1, p. 181f., suggests, nowhere is π mentioned for these measuring vessels which include GIŠ.BA-RÍ-GA, GIŠ.BA-AN/BÁN and GIŠ.NINDA.

A contrary opinion was expressed by Thureau-Dangin, "La mesure du 'qa'," *RA* 29 (1932) 189f., who believed the vessel to be a cylinder; in *RA* 33 (1936) 60, he noted that the measure of the QA remains uncertain as long as the shape of the receptacle is unclear. For further discussion, see Thureau-Dangin, *RA* 34 (1937) 80f. Note that YBC 4669, problem B9 (*MKT* 1, p. 514f.; *MKT* 3, p. 26f.) is not clear but seems to involve two containers. Compare Haddad 104, problems 1-5 (Al-Rawi and Roaf, *Sumer* 43 [1984], 175-218), of which problems 1, 4, and 5 involve a cylinder, and problems 2 and 3, a truncated cone; two coefficients are used: 0;5, the circumference coefficient used to calculate the area of a circle from the circumference square and an approximation of ¼π, and 6,0, the grain capacity coefficient used to calculate the capacity in PI from the volume in SAR. Problems 1-3 concern an *išu* "log"; in problem 1 a cylinder of 1 KÙŠ diameter and depth, and in problems 2 and 3, a truncated cone of 10 GUR and 1 GUR, respectively. Problem 2 uses an incorrect formula which results in a volume 12/13 smaller, enough, perhaps, to wipe out any profit; this may be a theoretical problem! Problem 4 is a cylindrical *qûm*, and problem 5, a cylindrical *sūtu*. Salonen's study, *Hausgeräte* 2, suggests that vessels were made from a variety of materials such as gold, silver, stone, clay, copper, bronze and reed (basket); but shape is rarely mentioned.

118. YBC 4652 (*MCT*, p. 100f.); MM 86.11.404 (*MCT*, p. 140f.); IM 53957 (Baqir, *Sumer* 7 [1951] 28f.: no. 5); YBC 4698, problem 17 (*MKT* 1, p. 513; *MKT* 3, p. 42f.); YBC 4669, problems B3-5 (*MKT* 1, p. 514f.; *MKT* 3, p. 26f.); AO 6770, problems 3, 5(?) (*MKT* 2, p. 37f.; *MKT* 3, p. 62f.). Note BM 85194, problems 10-13 (*MKT* 1, p. 142f.) and BM 85210, problems 11 and 12 (*MKT* 1, p. 219f.) deal with three-dimensional forms but shape is not taken into account in the mathematical calculations.

119. For example, YBC 4652 (*MCT*, p. 100f.); AO 6770, problem 3 (*MKT* 2, p. 37f.; *MKT* 3, p. 62f.).

120. YBC 9856 (*MCT*, p. 99f.) and YBC 4673, problem 16 (*MKT* 1, p. 506f.; *MKT* 3, p. 29f.); see discussion of work totals in canal problems in *MCT*, p. 84f. nos. 6 and 7.

121. BM 85194, problem 23 (*MKT* 1, p. 142f.).

122. BM 85196, problem 12 (*MKT* 2, p. 43f.).

123. BM 85196, problem 13 (*MKT* 2, p. 43f.).

124. YBC 4669, problem B10 (*MKT* 1, p. 514f.; *MKT* 3, p. 26f.).

number (of workers) necessary to produce (?) three kinds of wool,[125] and finally a series of equations involving the unexplainable term Ú-KIN, of which KIN perhaps has to do with *šipru* "work."[126]

15. *Metalworks*

This category also includes a variety of topics: how much silver was given to make a *ruqqu*, perhaps a standardized sheet of metal[127]; silver coils (we know that in the Ancient Near East metals were conserved in coils)[128]; and an alloy problem with the ration of gold to bronze fixed at 1:9 (we know a few grains of bronze were added to gold for red color).[129] Finally, a Mari tabular text presents 13 or 14 entries concerning the loss of metal either during fabrication or as a tax for washing and heating.[130]

16. *kiššû* "reed bundles"

kiššû and the term *nalbantu* are no longer to be translated by "truncated cone" and "truncated pyramid," respectively, but rather by their primary meanings. *kiššû* is a "bundle of reeds" and *nalbantu*, of which the exact meaning is unknown, must, from the root *lbn* have something to do with brickmaking.[131] The Babylonians used objects around them in order to conceptualize solid geometric forms.[132] The shape of the reed bundles is standardized as a truncated cone of given dimensions.[133] *nalbantu* is not to be confused with *nalbanum* "a brick mold," which has coefficients relating to the size of bricks.[134] In fact, its dimensions have nothing to do with the size

125. YBC 4673, problem 16 (*MKT* 1, p. 506f.; *MKT* 3, p. 29f.).

126. YBC 4673, problem 17 (*MKT* 1, p. 506f.; *MKT* 3, p. 29f.); Neugebauer, *MKT* 1, p. 506, believes the text helps build a case for localized composition of analogous content and terminology from Kish as AO 10822 (*MKT* 1, p. 123f.).

127. YBC 4669, problem B6 (*MKT* 1, p. 514f.; *MKT* 3, p. 26f.). J. Friberg suggested this explanation of *ruqqū* in discussing this problem with me. Neugebauer and Sachs, *MCT*, p. 138f., note that the mention of area, not volume, would seem to indicate a flat object; in addition, YBC 4669, problem B6 justifies a relation of 1 GÍN silver and an area of 3 ŠU-SI square, that is, (0;0,30 GAR)² = 0;0,0,15 SAR. The reciprocal of 0;0,0,15, namely 4,0,0, may be the 4 listed as a coefficient of *ruqqū* of silver in YBC 5022:26 (*MCT*, p. 132f.); compare YBC 7243:51 (*MCT*, p. 136f.), which notes 26,40 as the coefficient for *ruqqū* of silver. Cf. Oppenheim, "Review of Neugebauer and Sachs, *MCT* (1945)," *JNES* 6 (1947) 126-128 suggests the meaning "grate" for *ruqqū*.

128. BM 85196, problem 18 (*MKT* 2, p. 43f.); Thureau-Dangin, *RA* 32 (1935) 27; Hallo, review of Limet, *Le travail du métal*, in *BiOr* 20 (1963) 138, notes that spiral bands were found in grave deposits; these bands served as the precursors of coined money and generally weighed 5 GÍN. However, BM 85196, problem 18 concerns finding the weight of silver such that as one goes up the other goes down; these coils do not weigh 5 GÍN.

129. In BM 34568, problem 16 (*MKT* 3, p. 14f.) the method of calculation is similar to BM 85196, problem 18 (*MKT* 2, p. 43f.); see Limet, *Le travail du métal au pays de Sumer au temps de la IIIe dynastie d'Ur* (Paris, 1960), p. 44f.

130. Soubeyran, *RA* 78 (1984) 41f., text 8; a similar text appears in ARM 24, No. 146. See Oppenheim, "A Fiscal Practice of the Ancient Near East," *JNES* 6 (1947) 116-20.

131. For example, *CAD* K, pp. 460f.; *CAD* N/1, pp. 200f.; Kilmer, *Or*NS 29 (1960) 273-308; Sachs, "Some Metrological Problems in Old Babylonian Mathematical Texts," *BASOR* 96 (1944) 29-39.

132. It should be noted that an item may have more than one shape. See, for instance, *išu* "log" in Haddad 104, problems 1-3 (Al-Rawi and Roaf, *Sumer* 43 [1984], 175-218): in problem 1 *išu* is a cylinder, and in problems 2 and 3 it is a truncated cone. Also, a given shape may be associated with more than one item (for example, a truncated pyramid is indexed as *nalbantum* in BM 85196, problem 11 [*MKT* 2, p. 43f.] and BM 85210, problem 9 [*MKT* 1, p. 219f.], as *birītu* "moat" in BM 85194, problem 28 [*MKT* 1, p. 142f.], and as *manzazu* "socle" in BM 85210, problem 8 [*MKT* 1, p. 219f.]). See *MCT*, p. 3, for a discussion of translation and transcription of texts.

133. BM 85194, problems 14, 15 (*MKT* 1, p. 142f.); BM 85196, problems 2, 5 (*MKT* 2, p. 43f.); see Sachs, *BASOR* 96 (1944) 33-37.

134. *MCT*, p. 137f.; YBC 5022:3, 4, 6, 9, 11, 13, 14 (*MCT*, p. 132f.); *TMS*, text III (= Tablet I), 27:45; Haddad 104, problems 9 and 10 (Al-Rawi and Roaf, *Sumer* 43 [1984], 175-218); M. A. Powell, "Metrological Notes on the Esagila Tablet and Related Matters," *ZA* 72 (1982) 106-23.

of bricks. Thureau-Dangin suggested that *nalbantu* may be a platform for molding or drying bricks.[135]

17. *Wall with wood on top and wood or reed (leaning) against a wall*

These problems illustrate the rare case in which Babylonians used the objects around them to conceptualize plane geometric forms, as here the triangle.[136]

18. *iṣu* "log"

Two groups of problems are involved here: (1) the thickness of a log measured in SÌLA[137] and (2) possibly standardized measuring vessels.[138] In Haddad 104 in *Sumer* 43 (1984) 175-218, Farouk Al-Rawi and Michael Roaf published a tablet in which a log is depicted as a cylinder of standard depth and diameter of 1 KÙŠ and as a truncated cone of 10 GUR and 1 GUR. Marvin Powell[139] has drawn the two groups together by noting that log metrology began as the measurement of cylindrical solids and was later used to eliminate the necessity of transforming volume units into capacity units.

19. *Forest and reed thicket*

Perhaps to be included in the category of logs, below (19), is a broken text concerning *apu* "canebrake" (glossed with GIŠ.GI) and *qištu* "forest."[140]

20. *Doors*

Two problems involved with finding the diagonal of a door are again rare instances in which objects from everyday life are used to teach a plane geometry concept.[141]

21. *Bitumen or mud plaster*

Mesopotamians used mud brick in building because the raw materials were readily abundant and the resulting structures could be easily repaired. A coat of mud plaster was used to protect

135. *RA* 32 (1935) 16.

136. AO 6484, problems 3, 4 (*MKT* 1, p. 96f.); BM 85196, problem 9 (*MKT* 2, p. 43f.); BM 34568, problem 12 (*MKT* 3, p. 14f.).

137. YBC 8600 (*MCT*, p. 57f.); VAT 8522, problem 1 (*MKT* 1, p. 367f.). YBC 8600 uses the coefficient 4,48 to convert GAR to SÌLA; VAT 8522, problem 1 uses the coefficient 5,0 for the same conversion. For discussion comparing the use of these two coefficients, see *MCT*, p. 58f. Note that the coefficient lists, YBC 5022:58 (*MCT*, p. 132f.) and YBC 7243:35 (*MCT*, p. 136f.) indicate 4,48 as the coefficient "of the thickness of a log."

138. Haddad 104, problems 1-3 (Al-Rawi and Roaf, *Sumer* 43 [1984], 175-218). Two coefficients are used: 0;5, the circumference coefficient used to calculate the area of a circle from the circumference square, and 6,0, the grain capacity coefficient used to calculate capacity in PI from volume in SAR. Lewy, *JAOS* 67 (1947) 305-20 suggests that YBC 8600 (thickness of a wooden log) assumes standardized *qû* measuring vessels cut from logs of the same height but different sized bases as in Haddad 104.

139. *AfO* 31 (1984) 42f.

140. *TMS*, text XXV, (= Tablet U) problem 2, p. 122f. M. Rutten and E.M. Bruins, *TMS*, p. 124, suggest a similarity between this problem and VAT 8522, problem 1 (*MKT* 1, p. 367f.).

141. VAT 6598, problems 5, 6 (*MKT* 1, p. 277f.) give two approximations for the diagonal of a door. Both problems involve the same data and both are illustrated by drawings. *TMS*, text XV (= Tablet E), p. 88f., offers two possible solutions (*not* methods) to the same problem involving Pythagorean triples 3a-4a-5a; this problem is not accompanied by a drawing. See IM 52304 (Goetze, *Sumer* 7 [1951] 126-155: Sections F and G: 142-143).

the mud bricks from rain.[142] Bitumen could be used for waterproofing and paving roads.[143] The amounts calculated in the problems are realistic.

22. *Foundation for a wall and pillar*

This category involves three volumes of rectangular prisms which form a basic building shape in building plans and in excavations.[144]

23. *Mari texts*

These texts deal with administrative topics.[145] Three are tabular and the subjects include the number of grains accumulated each day of the month,[146] the number of sheep consecrated for an *ikribu* offering and the number of sheep set free,[147] the amount of precious metal lost during a particular treatment,[148] and finally the accumulation of a quantity of grain according to an official fixed tariff.[149] The Mari tabular texts form a bridge between economic/administrative texts and mathematical texts. In this context, a reference to the *zazakku*, a high administrative official from the scribal hierarchy connected with the assessment of taxes, is pertinent:

> PN DUB.SAR.ZAG.GA *ša ana* PN_2 [*išš*]*aknu ana tupšarrūtim utīrma ana* É.DUB.BA *ī*[*rub*]
> "He sent the *zazakku* scribe who had been assigned to PN (to assist the tax officials[150] in their assessment of taxes) back to study, and he attended the *edubba*."

In reality, because the scribal titles are not clearly defined, we do not know if scribes were required to have a varied background, or if preparation for their posts involved a high degree of specialized study. We cannot determine whether advanced mathematical training included all or

142. Haddad 104, problems 7 and 8 (Al-Rawi and Roaf, *Sumer* 43 [1984], 175-218); S. Dunham, *A Study of Ancient Mesopotamian Foundations* (unpub. Ph.D. diss., Columbia University, 1981), pp. 15-24. A coefficient of 5 *middum* is used in Haddad 104.

143. AO 6770, problem 4 (*MKT* 2, p. 37f.; *MKT* 3, p. 62f.); Thureau-Dangin, *RA* 33 (1936) 80 n. 2. A coefficient of 0;15 QA is used in AO 6770, problem 4. Also, see Kilmer, *Or* NS 29 (1960) 291: IV A for a list of coefficients for *kupru* "bitumen." To this list should be added *TMS*, text III (= Tablet I) 27:67.

144. NBC 7934 (*MCT*, p. 55f.) may represent a basic building shape; see E. Heinrich and U. Seidl, "Grundrisszeichnungen aus dem Alten Orient," *MDOG* 98 (1967) 24-45, and Dunham, *RA* 76 (1982) 27-41. In our discussion of this text, S. Dunham noted that the basic building shape between walls and in house plans is or .

145. Soubeyran, *RA* 78 (1984) 48.

146. Soubeyran, *RA* 78 (1984) 30f., text 6. The number of grains accumulated each day of the month, that is, 1-30, is on the basis of 2n . . . n, that is, 2 grains on the first day, etc., with a grain being 1/180 *šiqlu*. See Sachs, "Notes on Fractional Expressions in Old Babylonian Mathematical Texts," *JNES* 5 (1946) 203-14, for discussion of ŠE written as *uṯṯetum* to express this fractional metrological unit.

147. Soubeyran, *RA* 78 (1984) 35f., text 7, presents a religious context for a mathematical text, that is, whoever consecrates *x* sheep for an *ikribum* offering, *y* sheep shall be set free alive. Text 7 parallels ARM 24 260, which begins with the introduction "when a man in his *ikribum* offering consecrates a great number of sheep to Iltum," continues with parallel tabulation and ends with the instruction that two marks be made on those sheep which remain alive and become the property of the goddess Iltum. The proportion of living sheep to consecrated sheep does not follow either a geometric or an arithmetic pattern. The text presents a progressive tariff which may have been useful in the temple accounting procedures.

148. Soubeyran, *RA* 78 (1984) 41f., text 8, describes the amount lost (*maṭûm*) from a mass of precious metal during a particular treatment. In line 6 the formula is followed by UR-MAḪ "lion," perhaps indicating a record of metal lost during fabrication. A similar text in ARM 24 146 also records masses of the order of 1 *ma-na*.

149. Soubeyran, *RA* 78 (1984) 46f., text 9, illustrates the accumulation of a quantity of grain according to an official fixed tariff at an exceptional rate.

150. *enku*: written ZAG.ḪA. See A.W. Sjöberg, "The Old Babylonian *eduba*," in *Sumerological Studies in Honor of Thorkild Jacobsen*, AS 20 (1975), pp. 160ff.

only some sub-categories of problem texts to prepare scribes for scribal positions. We cannot ascertain how much training in practical matters was provided by the schools and how much was learned on-the-job, particularly since school curriculum was not standardized for all of Mesopotamia.[151]

The purpose of the cuneiform mathematical texts was most probably to train scribes. By virtue of the variety of topics covered and the depth of knowledge required, these texts provided rigorous training for a scribe seeking one of the many administrative posts such as:

ṭupšar ṣābim "scribe for laborer groups,"
šassuku "field scribe, land registrar, geometer,"
ṭupšar ummāni "military scribe,"
ṭupšar šarri "royal scribe,"
ṭupšar nikkassi "mathematics professor,"
ṭupšar piqitti "administrator,"
DUB-SAR A-RI/RU-A "district scribe,"
zazakku "public secretary to high officials,"
sandabakku "high administrative official,"

or even *ṭupšar immê* "ordinary clerk."[152]

As a bilingual proverb notes:

nam-dub-sar giš-šub-ba-sig$_5$-ga-tuku ^{d}lama-igi-zalág-ga nì-šà-ḫab é-gal-la-gé *tup-šar-ru-tú i-diš-šú da-ma-qi ra-še-e la-mas-si i-nu na-mir-tu ḫi-siḫ-ti ekalli*
"The scribal art, receiving a handsome fee, is a bright-eyed guardian, the need of the Palace."

I.e., the scribe at the height of his career provides his master with guidance on policy decisions and defends his interest with the vigilance of the magical *lamassu* at the palace gate; the scribe's reward is a high-level civil service appointment within the bureaucracy,[153] because

nam-dub-sar-ra ama-gù-dé-ke$_4$-e-ne a-a um-me-a-ke$_4$-eš
"The scribal art is the mother of speakers, the father of scholars.[154]

151. P. Michalowski, review of L. Cagni, *Brief aus dem Iraq Museum*, AbB 8, in *JCS* 35 (1983) 226.

152. Landsberger, "Babylonian Scribal Craft and Its Terminology," International Congress of Orientalists 23 (1954) 123-26; *AHw* 3, p. 1395f.

153. Gadd, *Teachers and Students in the Oldest Schools* (London, 1956), p. 37f.

154. J. Laessøe, "Literacy and Oral Tradition in Mesopotamia," in *StOr Iammi Pedersen . . . dicata* (Einar Munsgaard, 1953), pp. 205-218.

A Babylonian Lunar Ephemeris from Roman Egypt

OTTO NEUGEBAUER

To the memory of A. Sachs

I owe it to the courtesy of Prof. D. Jordan (University of Wisconsin) and Prof. Colker (University of Virginia) that I can make accessible a papyrus fragment in the possession of Prof. Colker, which is of unusual interest for the history of ancient astronomy. The papyrus was purchased by Prof. Colker in 1964 from a dealer in London who in turn had acquired it from a dealer in Holland.

The astronomical text is written on the side with vertical fibers, thus presumably on the "verso." As far as I can see, the writing on the recto has nothing to do with astronomy. Reusing a papyrus sheet is, of course, a well attested practice. On the basis of my experience limited to astronomical papyri,[1] I would guess a date in the second/third century A.D. (or later) for our fragment.

The importance of the text lies in the relatively well preserved column II. There we have a sequence of sexagesimal numbers of constant difference (d = 22,30,0) forming a "linear zigzag function" well known from Babylonian astronomy. The total of two lines preceding and following a maximum is always 2M - d = 8,36,24,10, hence M = 4,29,27,5. Similarly for a minimum 2m + d = 4,7,39,10, hence m = 1,52,34,35. Sequences based on these parameters are found in many Babylonian lunar ephemerides belonging to "System B" and represent the length of the synodic month under the assumption of constant solar anomaly. Its mean value corresponds to a mean synodic month of 29;31,50,8,20^{d}, a value frequently attested in ancient and medieval astronomy and famous since Kugler's *Mondrechnung*[2] as evidence for Babylonian influence on Greek astronomy.

We are quite well informed about Babylonian lunar theory.[3] Its ephemerides have as goal the determination of the accurate dates of the first crescent or of the full moon, a procedure which requires 15 or more interlocked numerical columns.[4] Since an isolated column (like our column

1. Cf. R.A. Pack, *Greek and Latin Literary Texts from Greco-Roman Egypt* (2nd. ed.) (Ann Arbor, 1965), Nos. 2002 to 2067.

2. F.X. Kugler, *Die babylonische Mondrechnung, zwei System des Chaldäer über den Lauf des Monds und der Sonne* (Freiburg, 1900).

3. Cf. for details my *Astronomical Cuneiform Texts* (Princeton and London, 1955), vol. I, p. 78, quoted *ACT*, and *History of Ancient Mathematical Astronomy* (Berlin and New York, 1975), p. 483.

4. Cf. *ACT* I, p. 43.

G) is of no interest, our fragment not only demonstrates the existence, in a Greek version, of *one* component, but only makes sense as part of the whole numerical procedure. This means that astronomers in the Roman period in Egypt had access not only to a few period relations and some early eclipse observations, but could study in detail the Babylonian numerical analysis of the lunar motion. Needless to say, this drastically changes the modern discussion of transmission of Babylonian to Greek astronomy.

Using a Diophantine equation[5] one can show that no preserved cuneiform text can be continued so as to give the numbers in the papyrus. This is not surprising since it would mean continuation over centuries without any numerical adjustment or modification. Even in the Babylonian tablets of System B with column G connectibility is not the rule.[6] It also should be noted that column G repeats all its value after 251 months (that is, about 20 years), and is therefore of little significance for dating.

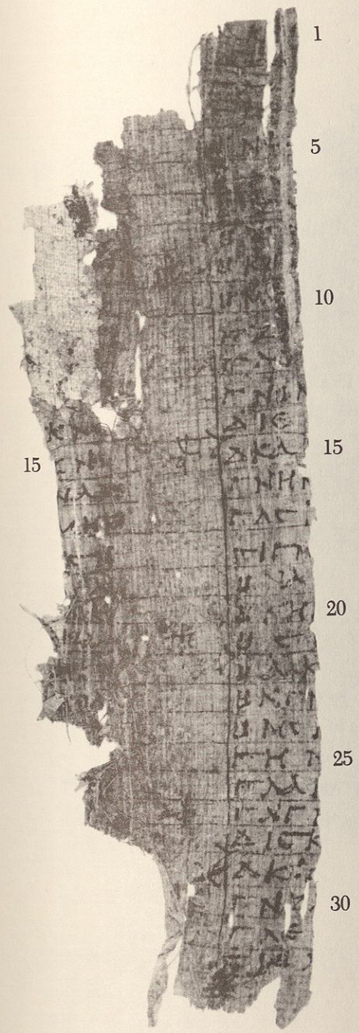
A question for which I have no answer is the problem of the calendar in which the lines of our text are counted. In the Babylonian texts the months are real lunar months, either full or hollow, a distinction which the ephemerides are computed to determine. No such calendar is known to us for the Roman period, even including the Jewish lunar calendar. For the astronomical understanding, a simple counting of lines would of course suffice.

In the Babylonian material, ephemerides of this type are carried on at least to the determination of the moments of the true conjunctions. Other texts continue the computations in order to find the time of first or last visibility. The interest in the true conjunction by itself would lie, of course, in the prediction of eclipses, successfully carried out for lunar eclipses.

Of column 1, unfortunately, only small remnants are preserved (lines 14 to 21). As expected, they belong again to numerical material. An interesting item is the sign "zero" at the end of line 17, a small circle with a bar over it, also attested in this form in astronomical papyri of the second or third century.[7] Since column II contains a column G, one would expect a column F (lunar velocity) for column I. From the Babylonian material we know of three versions of this function:[8] an accurate and a slightly rounded version that gives the lunar velocity in degrees per day (accurate mean value 13;10,35) and an equivalent column (F′) that uses degrees per "large hour" (that is, $1^{H} = 4^{h}$), useful for eclipse observations. The fact that our fragment seems to involve numbers of more than three digits would lead us to expect a column F′ but the remnants in our text do not support this assumption—as, for example, a comparison with the ephemeris *ACT* No. 120 Rev. II reveals. I have to confess that I do not know how to interpret this column.

The following gives the reconstruction of column II.

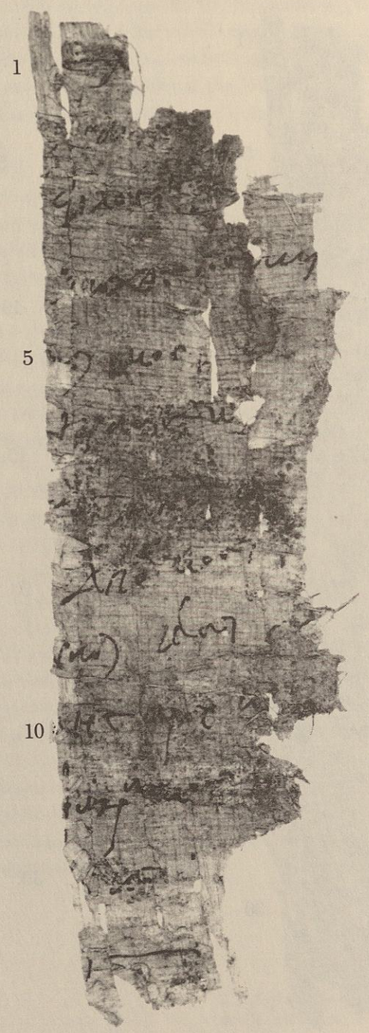
5. Cf. *ACT* I, p. 78.
6. Cf. *ACT* I, pp. 41, 124.
7. Cf. Irani, *Centaurus* 4 (1955) 11, Table 8.
8. Cf. *ACT* I, p. 76.



1.	[αφ]	4,2[2, 34, 10
		4, 0, 4,[10
		3,3[7, 34, 10
		3,1[5, 4, 10
5.		2,5[2, 34, 10
		2, 30, [4, 10
		2, 7,[34, 10
	πρ	2, 0, [5
		2, 22,[35
10.		2, 45, [5
		3, 7,3[5
		3, 30, [5
		3, 52,3[5
		4, 15, [5
15.	αφ	4, 21,[19, 10
		3, 58,[49, 10
		3, 36,1[9, 10
		3, 13,4[9, 10
		2, 51,[19, 10
20.		2, 28,[49, 10
		2, 6,[19, 10
	πρ	2, 1, 20
		2, 23,5[0
		2, 46,[20
25.		3, 8,5[0
		3, 31,2[0
		3, 53,5[0
		4, 16, 20
	[αφ]	4, 20, [4, 10
30.		3, 57,3[4, 10
		3, 35, [4, 10
		3, 12,3[0, 10

All restorations of the first three digits are secure. This can be shown, for example, from line 32 and line 28. In line 32 one could perhaps restore 3,12,3[1 (up to 3[9). But this would require in line 28 the number 4,16,19 (or less) against 4,16,20, in the text.

Hence only the fourth digit remains in doubt. The cuneiform texts give either 30 and 40 in alternating branches (for new moons) or 10 and 0 for full moons. But 30 + 40 = 1,10 at the extrema would influence the third digit, which is excluded as we have just shown. Hence only 10 and 0



remain possible; 1 and 9, or 2 and 8, etc. are nowhere attested. According to the cuneiform texts, 10 belongs to the decreasing branches as I have also assumed here. At any rate the exclusion of 30 and 40 leaves us only with an arrangement typical for full moons.

The signs πρ/αφ, corresponding to tab/lal, are not explicitly found in column G of Babylonian ephemerides.

A Unique Late Sargonic River Ordeal in the John Frederick Lewis Collection

DAVID I. OWEN

To the few who knew him up close, Abe Sachs was an incredible repository of Assyriological knowledge which he shared generously and unstintingly. To the many who knew him from afar, Abe was a legend in his own time who always took the time to respond to letters, often in great detail. Abe's catholic interests ranged from early historical times in Sumer through the twilight of Babylonian civilization. One of the collections of cuneiform texts that Abe examined earliest during his long and distinguished career was that of the John Frederick Lewis Collection in the Free Library in Philadelphia (=FLP). From his occasional notes found among those tablets and from others which, with characteristic generosity, he kindly turned over to the Babylonian Section of the University Museum in Philadelphia for use by interested students and scholars, it is clear that Abe carefully examined most, if not all, of the nearly three thousand documents in that collection.[1] Although no notes to the text published here were found, I would like to believe that such a unique piece would hardly have missed his critical eye and that he had already recognized its importance. Publishing it here is thus, in a sense, a continuation of the work begun by the scholar and colleague whose fond memory we recall with this volume.

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The judicial water ordeal is first documented in sources from the Sargonic period,[2] but the interpretation of these sources is difficult at best and often unclear. Yet the presence of these texts

1. In his notes on deposit at the University Museum, Abe Sachs recorded 2849 texts in the collection, including 149 duplicates. This would indicate that he had, in fact, gone through the entire collection, representative of nearly all periods of cuneiform studies, quite carefully although to judge from the preponderance of observations on texts from the first millennium, the latter received his greatest attention.

2. For the most detailed study of the institution of the river ordeal, see Tivka S. Frymer-Kensky, *The Judicial Ordeal in the Ancient Near East* (unpub. Ph.D. diss., 2 vols; Yale University, 1977 [Ann Arbor: University Microfilms, 1978]). For the Sargonic period, see her chapter "The Ordeal in the Old Sumerian-Akkadian Period," pp. 66-84. A revised version of the dissertation is scheduled to appear in Bibliotheca Mesopotamica in the near future; I have not seen this version.

coupled with the existence of numerous personal names utilizing the divinized river, $^{d}I_{7}$, suggests that the institution of the judicial river ordeal was widespread throughout the Sargonic period.[3] Thus the discovery of FLP 37,[4] a well preserved late Sargonic witnessed ordeal, is of particular interest and importance for the history of legal institutions.[5] The text, in twenty-one lines, is inscribed on a rounded and slightly elongated, clay, bulla-shaped tablet (see photo and copy below), approximately six centimeters wide along the horizontal axis and five centimeters high along its vertical axis.[6] The clay has been wrapped around a cord (not pierced later to insert a cord[7]), presumably to allow the text to be worn around someone's neck, to be carried around the wrist, or to be hung from a peg.[8] Its physical form may be compared to a recently published Old Akkadian letter[9] written on a somewhat rounder, almost lenticular shaped, piece of clay, which had also been wrapped around a cord for wearing or suspension.[10] This Old Akkadian text, however, is very small, about half the size of ours. One other text appears to be even closer both in form and function. First published by M. Lambert,[11] and then republished with excellent photos by I. J. Gelb,[12] it was described by Gelb as a "perforated cone." The photos clearly show it to be very similar to the shape of our text. Furthermore, Gelb describes it as a "witnessed memo concerning an oath?" While it does not contain any reference to an ordeal, an oath (x ì-da-tar) appears to be the central concern. Like our text, it is witnessed by three individuals. From the ductus, it would appear to date somewhat earlier in the Sargonic period than does our text. It is curious to have three physically similar rare tablets, albeit with different contents, which date roughly to the same period and which appear to have been specially designed, possibly with similar functions in mind.[13] The fact that the two legal texts, both of which concern the taking of

3. Frymer-Kensky, *Judicial Ordeal* 1, p. 66.

4. The text was already identified and selected for separate publication in 1973 but for various reasons it was not until this occasion that I could return to it. It was, however, made available to others who were working on the subject. For a description of the FLP collection see the writer's *The John Frederick Lewis Collection: Texts from the Third Millennium in the Free Library of Philadelphia*, Materiali per il vocabolario neosumerico 3 (Rome, 1975) 13-14. A complete, annotated catalogue of the collection has apparently been completed by Dr. Maria deJong Ellis under a grant from the National Endowment for the Humanities; eventually to be published in the Occasional Publications of the S. N. Kramer Fund of The University Museum. I would like to thank the authorities at the Rare Book Room, Free Library of Philadelphia, for permission to publish this text and for all the kindnesses extended to me during the years I worked on their collection.

5. A copy of this text had been sent to T.S. Frymer-Kensky while she was working on her thesis and she included a transliteration with comments on FLP 37 in her dissertation (*Judicial Ordeal* 1, pp. 78-79, 82-84). It is my intention here to publish the original text and to make it available to a wider audience for discussion. I have greatly benefited from her detailed observations, although it is inevitable that our analyses and interpretations of the original text will differ to some extent.

6. The description of the text by Frymer-Kensky, *Judicial Ordeal* 1, p. 78, based on an earlier copy of mine, is not quite correct. The tablet is neither lentil-shaped nor "hollow." Examination of the original clearly shows that the clay had been wrapped around a cord; it had not been pierced. In any case neither condition can be described as "hollow."

7. Contra Frymer-Kensky, who describes it as "looks as if it once had a thong or rope *threaded* [sic!, emphasis mine] through the holes in its sides" (*Judicial Ordeal* 1, p. 78).

8. I do not think that it was made to be "tied to an offering of some kind," as suggested by Frymer-Kensky, *Judicial Ordeal* 1, p. 78.

9. K. Veenhof, *JEOL* 24 (1975-76) 105-110. The text is quite small, having a diameter of ca. 2.8 centimeters, about half that of FLP 37.

10. As described by Veenhof, *JEOL* 24 (1975-76) 105.

11. *ArOr* 25 (1976) 521ff.

12. MAD 4 (1970) 99-100 and pl. xxv.

13. These two texts are not to be compared with the much more numerous clay tags or bullae which were meant to be fastened around cords and attached to merchandise, baskets, and similar objects. It is also not likely that our ordeal text and the Old Akkadian letter were meant to be hung on pegs (Veenhof, *JEOL* 24 [1975-76]); rather, these were to be worn around the neck or wrist. In the case of the Old Akkadian letter, it was probably worn by the messenger. In the case of the ordeal, it may have been worn by the individual who survived the ordeal, as I have suggested below, or, less likely, as Frymer-Kensky suggested (*Judicial Ordeal* 1, p. 79), to countermand a brand that had been placed on the individual. BRM 3 101 (discussed by B.R. Foster, *Umma in the Late Sargonic Period* [Hamden, 1982], p. 124 [= revised version of 1975 Yale University dissertation]) is a roster of personnel; similarly made, it may have also been carried. According to Foster, "A hint as to one possible purpose of these five vouchers is provided by BRM 3 101. This is pierced as if the person named carried the tablet on a string to avoid losing it "(Foster, *Umma*, p. 124). It is not clear to me to what Frymer-Kensky's comment and vague reference (*Judicial Ordeal* 1, p. 84) to Foster's 1975 dissertation refer when she suggests that BRM 3 101 and the other texts discussed by Foster were "*tied to the ear*" [emphasis mine] and not worn around the neck. If this was, in fact, suggested by Foster in his dissertation he did not repeat it in the published version of his work.

14. Prof. Edzard was kind enough to comment on a version of this text that I had sent to him (letter of 3.28.77).

15. Read as sù by Frymer-Kensky, *Judicial Ordeal* 1, p. 78, with no explanation.

16. Read as še in Frymer-Kensky, *Judicial Ordeal* 1, p. 78, probably a typographical error. She also suspected a possible loss of a sign at this point as indicated by her bracketed x, [(x)], but makes no suggestion as to what it might have been.

an oath, are formed around a cord, may add some support for the suggestion made below as to their function.

Our new text provides a witnessed account of a judicial river ordeal through which Ur-Dumuzida was absolved of unspecified charges brought against him by Ur-Enlila. Of the three witnesses, two were women. Although its exact interpretation may remain open to some debate, and will surely encourage additional discussion, its overall understanding appears to be certain. The text reads as follows.[14]

		Transliteration	*Translation*
col. i	1.	ur-^{d}dumu-zi/-da	Ur-Dumuzi
	2.	ì-im-gen	has gone (to the river ordeal).
	3.	ur-^{d}en-líl-lá/-ra	For Ur-Enlila,
	4.	ki ^{d}nin/-hur-sag	from (the place,) Ninḫursag
	5.	$^{d}i_{7}$-ta	at the River,
	6.	mu-na-ta-KAŠ$_{4}$	he (i.e., Ur-Dumuzi) came forth for him.
col. ii	7.	NAM.RU-bi	Its (i.e., the ordeal's) assertory oath
	8.	mu-na-tar	he swore to him.
	9.	BLANK	Blank line.
	10.	nam-gú-šè	With respect to the "charge,"
	11.	ba-ni-ak	he "absolved" him.
	12.	BLANK	Blank line.
col. iii	13.	ur-sa$_{6}$	Ur-sa,
	14.	sipa sanga	the shepherd of the sanga;
	15.	DIŠ ku-bu[15]-na/-rí	^{I}Kubunari,
	16.	dam ur-éš[16][-líl?]	the wife of Ur-eš[lil],
	17.	dam<-gàr>	the mer<chant>;
	18.	DIŠ nin$_{9}$-na-ni	^{I}Ninani,
	19.	dam é/-ḫé nar	the wife of Eḫe, the singer;
col. iv	20.	BLANK	Blank line.
	21.	lú-ki-inim/-bi-me	these people were the witnesses.

Commentary

Line 2: The use of the verbal form ì-im-gen, would suggest a date towards the end of the Sargonic period, perhaps even as late as Gudea. The script precludes a later date.[17]

Line 3: It is, no doubt, purely coincidental, but the name Ur-Enlila occurs as that of the principle in the first Sargonic judicial ordeal, published by A. Falkenstein (as pre-Sargonic)[18] and re-edited by D. O. Edzard (as Sargonic).[19]

Line 4: An alternate translation assumes a double genitive form, *ki ^{d}nin-ḫur-sag-gá-ka-ka; this is D. O. Edzard's view (personal communication). Since there appear to be other "defective" writings by the scribe of this text, this interpretation may be possible. In any case, I know of no reference to a "Place of Ninḫursag" nor of any specific association of Ninḫursag with the river ordeal. Indeed, none of the later hymns reveals any connection between ^{d}Ninḫursag and the ordeal.[20]

Line 5: In most of the other Sargonic ordeal texts[21] $^{d}I_7$ is usually followed by the comitative postposition /-da/. The use of the ablative-instrumental postposition /-ta/ here may signify that we are to interpret lines 4-5 as a single phrase governed by ki . . . ta, indicating the direction away from a person.[22] This would give a translation "For Ur-Enlila he (i.e., Ur-Dumuzida) went forth for him from (the place, [of?]) ^{d}Ninḫursag (at?/of?) $^{d}I_7$," assuming that the divine names were construed together as a single animate form, an interpretation which is not without difficulty. In any case, the use of the ablative-instrumental makes it clear that the verbs must be recording actions that have already taken place.

Line 6: The verb KAŠ$_4$ may simply be shortened writing for DUL.KAŠ$_4$ = e_{11}, "to go down into" or "to come up from". E_{11} is well known from judicial ordeal texts of the Sargonic period and would have been expected here. This is what we, in fact, assume was meant by the scribe. The ablative infix /-ta-/ clarifies the meaning. Another, less likely, possibility would be to read gir_5(=KAŠ$_4$) for gir_5-gir_5, *šalû*, "eintauchen"[23]; but such an interpretation would be difficult with the ablative-instrumental suffix /-ta/ used with $^{d}I_7$, reinforced by the ablative infix /-ta-/ in the verb.[24]

Lines 7-8: In view of the writing NAM.RU-bi mu-na-tar, "its oath he swore for him," it appears that the river ordeal had an additional component which included the assertory oath. While Edzard[25] assumed that the river ordeal was the more important form of evidence, making the assertory oath unnecessary, this text suggests both may have been required, at least at this period or in special cases. The writing, NAM.RU-bi for nam-érim(=NE.RU)-bi is either a defective writing or may support a reading ne-ru rather than érim, as already suggested by B. Landsberger,[26] at least in the form níg-ne-ru[27] instead of the expected níg-érim.[28]

17. See M.-L. Thomsen, *The Sumerian Language*, Mesopotamia 10 (Copenhagen, 1984), p. 174 §333.
18. *AfO* 14 (1941-44) 333-36.
19. *Sumerische Rechtsurkunden des III. Jahrtausends* (München, 1968), pp. 153-54 No. 98.
20. See discussion by T. S. Frymer-Kensky, *Judicial Ordeal* 1, pp. 99ff.
21. Conveniently collected by Edzard, *Sumerische Rechtsurkunden*, passim, and discussed once again by Frymer-Kensky, *Judicial Ordeal* 1, pp. 66-79 and passim.
22. Thomsen, *Sumerian Language*, p. 104.
23. *AHw* 3, p. 1153 s.v.
24. See also the comments of Frymer-Kensky, *Judicial Ordeal* 1, p. 82.
25. "Zum Sumerischen Eid," in AS 20, pp. 68-98, esp. 88 ff.
26. MSL 1, p. 223.
27. Which also occurs in Gordon, *Sumerian Proverbs* (Philadelphia, 1959), p. 42.
28. See also the comments of Frymer-Kensky, *Judicial Ordeal* 1, p. 82.

Line 9: The blank line indicates a change in subject or orientation of the document, as is shown by each of the three blanks of varying sizes (lines 9, 12, and 20), which the scribe carefully laid out. They also demonstrate that the scribe took great care in the execution of the document, even considering what we perceive as "defective writings."

Lines 10-11: Perhaps the most crucial interpretation in this text is for the compound verb nam-gú-šè . . . ak. Edzard[29] has collected and discussed the known examples of this form. His proposed translation, "versichten," would make good sense here, although his own examples revolve around the renouncing of claims to inherited goods. In our text the reasons necessitating the ordeal are not stated. Frymer-Kensky[30] questions Edzard's translation[31] on the basis of the later meaning of this term, given in the lexical lists as *ḫabālu* "to oppress, to wrong a person" (legally)[32] and *dullulu* "to oppress."[33] Frymer-Kensky suggests a possible meaning of "to reckon damages, to settle accounts," rather than "to renounce claims." However, as Krecher[34] has noted, the lexical texts always translate nam-gú . . . ak and not nam-gú-šè . . . ak. While the exact meaning of the compound verb in our context may not yet be fully determined, the general indication that it somehow implies the end of the litigation can be safely assumed.

Lines 13-14: Ur-sa_6 is a rather common name in Sumerian texts of the third millennium. Unlike the following two female names, no patronymic is provided here although his occupation as sipa sanga may help with some future identification in another text. His name is not preceded by a DIŠ sign as are the two female names following.

Lines 15-17: It is rather surprising to find that two of the three witnesses are in fact women. One might speculate that their presence had something to do with the charges that were brought in the case. But since none of the witnesses is otherwise known from other sources, such an attempt would be futile. The first of these names is ku-bu-nar-ri.[35] As far as I can tell the name is first attested in the Old Assyrian period, as ku-bi-na-ri and, in the reverse construction, as na-ar-ku-be (TCL 20 91:49 and ICK 1 130:5 respectively).[36] The element $^{(d)}$*kūbu*, whatever its meaning, frequently appears in personal names.[37] The reading of her husband's name is more difficult. Since the original cord emerged just beyond the second sign of this name, where the clay was slightly damaged, there may be a sign lost at this point (see photo and copy). The name form read ur-éš is not known to me; if the final sign was lost it could have been ur-éš-[lil], a name which is attested and which we restore here. The other possible reading, ur-zì-dam, taking the dam written on the separate line as the final sign of the name. This name is known from the Ur III period, written in the same way in MVN 3 166:5. However, in our text the second sign of the name is identical to the -šè/éš written at the end of line 10. Furthermore, the sign dam written by itself on the separately ruled line 17, which follows the man's name, makes no sense alone. Either it is to be read as the last sign in his name, ur-zì-dam, inserted after the scribe ran out of space on an already ruled text, or as the first sign of the defectively written professional designation dam <-gàr>. The simple meaning, "wife," would be redundant in this context although T.S. Frymer-Kensky[38] translated it as such without comment.

Line 19: The third and final witness has an attested name form, nin_9-na-ni, as does her husband, é-ḫé (or é-GAN), the singer. The third sign is to be read as an occupation and not the last sign of the name, as was the case with the designations of the previous two witnesses.

29. *Sumerische Rechtsurkunden*, pp. 106-107.
30. Frymer-Kensky, *Judicial Ordeal* 1, p. 83.
31. As does Krecher, "Neue sumerische Rechtsurkunden des 3. Jahrtausends," ZA 63 (1974) 258 ad III:8.
32. *CAD* Ḫ, p. 3 s.v. lexical section.
33. *CAD* D, p. 178, s.v. lexical section.
34. ZA 63 (1974) 258.
35. Read as ku-sù-na-rí by Frymer-Kensky, *Judicial Ordeal* 1, p. 78.
36. Apud *CAD* N/1, p. 376, s.v. *nāru* B.
37. See *CAD* K, p. 488, s.v. *kūbu* A c.
38. Frymer-Kensky, *Judicial Ordeal* 1, p. 79.

CONCLUSIONS

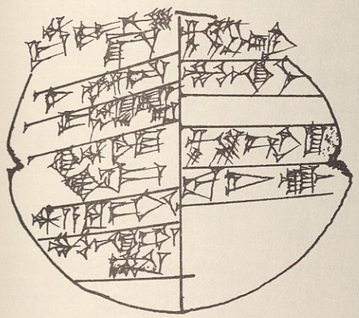
The unique nature of this text makes its interpretation all the more difficult. Nevertheless, by comparing it to contemporary judicial river ordeals and to what is known from later sources, we can suggest that this legal account was written to provide the documentation for the resolution of legal action brought by Ur-Enlila against Ur-Dumuzida for which the latter had to undergo an ordeal by water at a place (?) on the river ($^{d}I_{7}$) called ^{d}Ninḫursag The ordeal was witnessed officially by three individuals, two of whom were women. The nature of the litigation is unspecified but it may have had something to do with inheritance claims to judge from the use of the verbal phrase, nam-gú-šè ba-ni-ak. The fact that only a single individual, Ur-Dumuzida, had to undergo the ordeal, appears to indicate that the litigation did not involve a land dispute which, according to the analysis of Frymer-Kensky,[39] would have required both parties to undergo the trial by water. Virtually all the recorded Sargonic ordeals deal with disputes over land or property and not with criminal matters, [40] which should narrow the possible reasons for the litigation. I cannot explain why the witness list contained one male and two females.

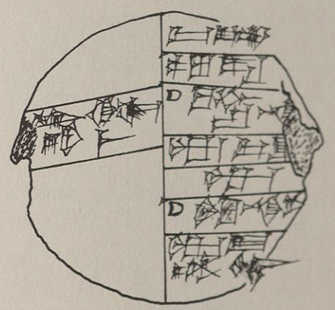
The physical form of the clay text, with its cord, might suggest that the document was worn, at least temporarily, to indicate the release from legal claims. Perhaps the wearing of the text was, in fact, part of the legal ceremony during which the text was written and placed around the defendant's neck to symbolize his successful emergence from the ordeal and release from legal charges. It is highly unlikely that the document was to be worn for any length of time, as implied by Frymer-Kensky's suggestion that it was worn "to countermand some physical mark of servitude which had been previously applied."[41] No supporting evidence for either of these suggestions exists.

39. Frymer-Kensky, *Judicial Ordeal* 1, p. 75.
40. Frymer-Kensky, *Judicial Ordeal* 1, p. 77.
41. Frymer-Kensky, *Judicial Ordeal* 1, p. 79.

FLP 37

obv. **rev.**





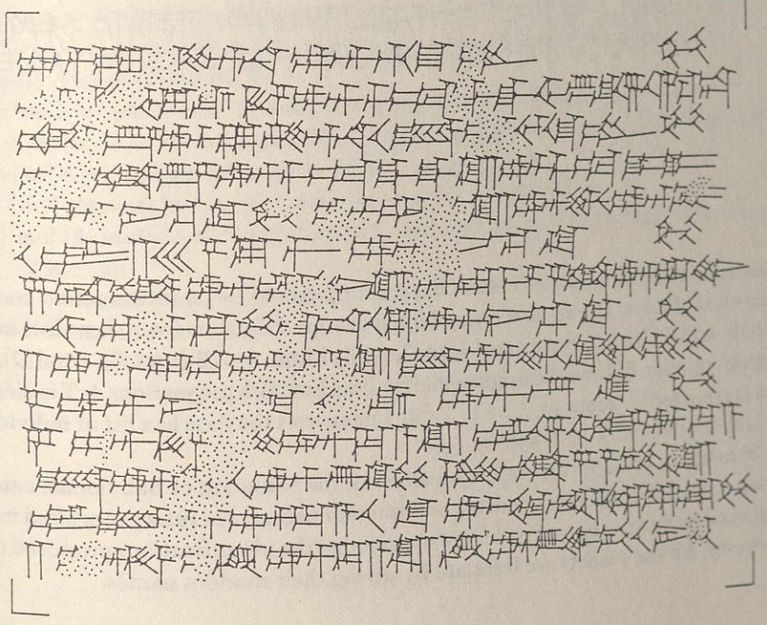
A Babylonian Star-Catalogue: BM 78161

DAVID PINGREE AND CHRISTOPHER WALKER

The tablet BM 78161 (88-4-19, 14) is one of a small collection for which no accession record is preserved. Given the date of acquisition, an original provenance in the area of Babylon or Sippar seems probable. The physical appearance of the tablet and script would suggest a date in the

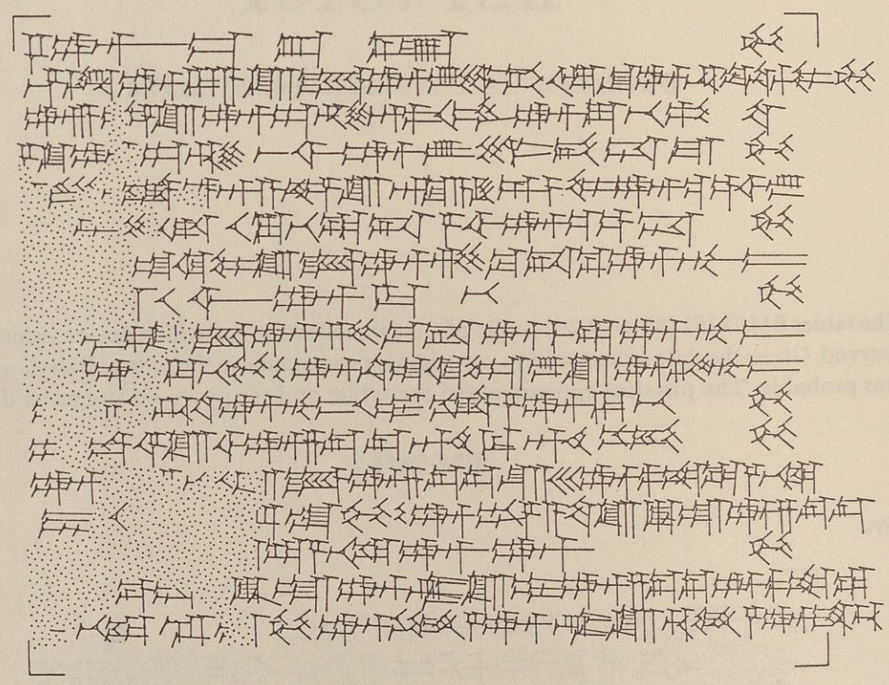
BM 78161

Obv.



seventh to fifth centuries B.C. The tablet was identified as a list of stars during preparation of the forthcoming eighth volume of the Museum's Catalogue of Babylonian Tablets. It is particularly appropriate to dedicate our edition to the memory of A.J. Sachs, since in reply to an early enquiry he supplied a copy of his own characteristically accurate transliteration of the tablet made in 1969.

Rev.



As indicated in the Commentary below, the text appears to be an incompetent conflation of two separate lists of stars. The ancient compiler has grouped the stars from these lists into twenty sections (here A to T) having the typical form "mul A, kimin mul B (mul C), (mul D), u mul E, gu." Our transliteration follows the original line for line, but with the sections A-T indicated. Our translation is arranged by sections, A to T. Table I interprets the data in a list of individual items arranged both by sections A to T and by "gu."

For the translations and approximate equivalents of the Sumerian or Babylonian names of the constellations (and Babylonian equivalents of Sumerian names) see references cited in footnote 7. We use literal translations here in order not to prejudge the identifications proposed in Table 1 below; however, for the planets we translate by giving their modern names.

Transliteration

1 (A) mul-sipa-[z]i-an-na mul-dar-˹lugal˺ gu
2 (B) ˹gìr^{II}-meš˺ *ù* ˹šu˺^{III}-meš *šá* mul-maš-tab-ba ˹gal˺-gal igi-*ú* šu *imittu*(15) *u a-si-du*
3 ˹egir˺-*ú šá* mul-sipa-zi-an-na *u* murub$_4$ ˹mul?˺-dar-lugal gu
4 (C) ˹gìr˺[^{II}] egir-*ú šá* mul-maš-tab-ba gal-gal kimin mul-maš-tab-ba tur-tur
5 [*u*] mul-kak-si-sá g[u] (D) mul-al-[lu]l kimin mul-muš mul-˹ban˺
6 *u* gìr^{II} *šumēlû*(2,30) *ša lu-maš* mu[l-k]ak-si-sá gu
7 (E) 5 uš egir mul-a[l-l]ul kimin ^{d}sag-me-gar *šá* egir mul-al-lul
8 *ina* igi ˹mul˺-ur-gu-˹la˺ gub *u lu-*<*maš*> mul-kak-si-sá gu
9 (F) 2 mul ˹*šá*˺ sag-du mul-˹ur-a˺ kimin murub$_4$ mul-muš *ki-ṣir am-mat*
10 *šá* mul-kak-[si]-sá *u* šu^{II} mul-nun-ki gu
11 (G) 4 ˹mul˺-meš ˹*šá* gaba˺ mul-ur-a kimin gìr^{II} *imittu*(15) igi-*tum šá* mul-ur-a
12 murub$_4$ mul-˹muš?˺ *u* mul-nun-ki gu (H) ½ danna egir 4 *šá* gaba-*šú* kimin
13 gìr^{II} murub$_4$-˹*tú šá*˺ mul-ur-a *u* šu mul-nin-maḫ *šá* ugu ka-kešda gu
14 (I) 2 ˹mul˺-meš ˹*šá* giš˺-kun mul-ur-a kimin kun mul-uga *u ni-*˹*šik*˺
15 *šá* mul-giš-gán-ùr gu
16 (J) *ēdu*(AŠ) *šá* kun mul-ur-a kimin murub$_4$ mul-uga *ù* šu mul-en-te-na-bar-ḫum gu
17 (K) mul-e$_4$-˹ru$_6$˺(A.EDIN) kimin mul-ab-sín ^{d}*šullat*(PA) *u ḫaniš*(LUGAL) mul-udu-idim-gu$_4$-ud
18 *šá* ana(ŠÈ) mu[l]-ab-sín *ina* igi mul-uga gub-*zu* gu
19 (L) ˹½ danna˺ egir [mu]l-e$_4$-ru$_6$(A.EDIN) kimin dingir-ku-a-meš *kal-lum* mul-giš-rín igi-*ú*
20 ˹mul-nu-muš˺-da *u* udu-idim-sag-uš *šá* igi mul-giš-rín gub gu
21 (M) [mul *na*]-*at-tul-lum* kimin murub$_4$ mul *zi-ba-nit* si mul-gír-tab
22 [x-x-*t*]*ú u* igi mul-ur-idim gu
23 (N) ˹mul-šu˺-pa ˹kimin˺ murub$_4$ mul *zi-ba-nit* mul-me sag mul-gír-tab
24 [*u*? muru]b$_4$ ˹mul˺-ur-idim gu:(O) mul *na-at-tul-lum* 2-*ú* kimin mul gaba gír-tab
25 ˹mul *ta*˺-*ri-tú* mul-gír-tab *u* gìr^{II} egir *šá* mul-ur-idim gu
26 (P) ˹mul˺ *kip-pat* kimin igi mul-za-ba$_4$-ba$_4$ ^{d}šár-ur ^{d}šár-gaz gu
27 (Q) mul [*šá maš*]-˹*a-ti*˺ ˹kimin˺ murub$_4$ mul-za-ba$_4$-ba$_4$ šu *šumēlû*(2,30) mul-pa-bil-sag *šá ina* ugu
28 ban *u* [mul-m]á-gur$_8$ gu : (R) mul *tak-šá-a-tú* kimin *kin-ṣi* mul-za-ba$_4$-ba$_4$
29 [*u*? šu?] *imittu*(15)? mul pa-bi]l-sag *šá ina* ugu *mul-mul* gu
30 (S) [mul] *e-*˹*du*˺ [*šá*] *kin-ṣi* mul-ùz kimin gìr mul-za-ba$_4$-ba$_4$ mul-pa-bil-sag
31 ˹*šá*˺ *ina* ugu má-˹gur$_8$˺ gu (T) mul-zubi(GÀM) *šá* mul-ùz kimin sa$_4$ *šá* mul-á-mušen

Translation

A The True Shepherd of Anu, the Rooster—a string.

B The front feet and hands of the Great Twins, the right hand and the rear heel of the True Shepherd of Anu, and the middle of the Rooster—a string.

C The rear foot of the Great Twins, or the Little Twins, and the Arrow[1]—a string.

D The Crab, or the Snake, the Bow, and the left foot of the constellation of the Arrow—a string.

E Five uš behind the Crab, or Jupiter which stands behind the Crab in front of the Lion, and the constellation of the Arrow—a string.

F The two stars of the head of the Lion, or the middle of the Snake, the elbow of the Arrow, and the hands of Nunki—a string.

G The four stars of the chest of the Lion, or the front right foot of the Lion, the middle of the Snake, and Nunki—a string.

H Half a *bēru* (i.e., 15°) behind the four of its chest, or the foot in the middle of the Lion, and the hand of Ninmah which is on the knot—a string.

I The two stars of the rump of the Lion, or the tail of the Raven, and the bite[2] of the Harrow—a string.

J The single (star) of the tail of the Lion, or the middle of the Raven, and the hand of EN.TE.NA.BAR.ḪUM—a string.

K Erua, or the Barley-stalk[3], Šullat and Ḫaniš, Mercury which stands towards the Barley-stalk in front of the Raven[4]—a string.

L Half a *bēru* (= 15°) behind Erua, or the Sitting(?) Gods, the front pan of the Balance, Numušda, and Saturn which stands in front of the Balance—a string.

M The Harness, or the middle of the Balance, the [. . .][5] horn of the Scorpion, and the eye of the Wolf—a string.

N ŠU.PA, or the middle of the Balance, the stars of the head of the Scorpion, [and the midd]le of the Wolf—a string.

O The second star of the Harness, or the star of the chest of the Scorpion, the upraised tail of the Scorpion, and the rear foot of the Wolf—a string.

P The Ring, or the eye of Zababa, Šarur (and) Šargaz—a string.

Q The Twins, or the middle of Zababa, the left hand of Pabilsag which is on the bow, and the Barge—a string.

R The Triplets, or the shin of Zababa, [and the right hand of Pabi]lsag which is on the arrow—a string.

S The single star of the knee of the Goat, or the foot of Zababa, (and the star of) Pabilsag which is above the Barge—a string.

T The crook of the Goat, or the bright star of the Eagle.

1. Note that according to our astronomical interpretation (Table I) mul-kak-si-sá here refers not to Sirius itself but to another bright star in the Babylonian constellation of the "Arrow." The fact that the constellation has a left foot and an elbow suggests a humanoid shooting the Arrow from the Bow. Compare the constellation of Virgo, known to the Babylonians for the Barley-stalk (Latin Spica = α Virginis) which she carries.

2. The term *nišku*, "bite" of a harrow, is not otherwise known, but presumably refers to its tines.

3. For the translation of mul-ab-sín as "Barley-stalk" see A.J. Sachs, "A Late Babylonian Star Catalog," *JCS* 6 (1952) 146 n. 2.

4. Note that although in many astronomical contexts "in front of" means "west of," in this context Mercury is east of the Crow since that constellation is visualized facing east; see TCL 6 25 and E. F. Weidner, *Gestirn-Darstellungen* (Vienna, 1967), pl. 10.

5. A restoration [*maḫ-ri*]-*tú*, "front," or [2,30]-*tú*, "left," would be possible.

Commentary

The tablet contains twenty sections which we have designated with the letters from A to T. All but the first and last contain: (a) either the name of a *ziqpu* star[6] or a time interval; (b) one or more star names[7]; and (c) the word gu, "string." The first section, A, contains (b) and (c), while the final section, T, contains (a) and (b). Thus, even though this copy forms a complete tablet, it appears on purely formal grounds that the original from which it was transcribed was missing the beginning and the end. The *ziqpu* stars included in our tablet are numbers XVIII (B) to XXVI (M) and I (N) to VII (T) in Schaumberger's list; in three sections (E, H, and L) time intervals are given. Assuming that the original contained *ziqpu* stars VIII to XVII, there were at least twenty-nine sections in the original text, and there may have been another (or others) with time interval(s). This assumption is supported by the fact that *ziqpu* XVII would fit reasonably well with gu I and *ziqpu* VIII perfectly with gu XXI.

In each section the stars are listed from north to south: *ziqpu* star (or time interval) and then stars from the path of Enlil, the path of Anu, and the path of Ea[8] in that order, though a star from each path was not always available. The substitution of a time difference in those sections for which a *ziqpu* star was not available, when combined with the word gu, "string," applied to each section, and the fact that the stars are listed from north to south suggest that each section contains the stars that lie along a great circle passing through the two celestial poles, a meridian circle along which each star has the same right ascension. This, in fact, is essentially true of this text, as is shown by Table I in which the *ziqpu* star numbers or the paths to which the stars belong according to MUL.APIN are shown along with the identifications of the stars that we believe to be correct and their right ascensions and declinations computed for -700.[9]

From this table it is clear that the text is in good order from gu I through gu IX, though a section for a right ascension of 76° seems to be missing after gu III. But for gu X we have only the *ziqpu* star; the stars of gu's XI, XII, XVII, XVIII, and XIX (sections J, K, P, Q, R) belong with the *ziqpu* star or time difference of the following sections (K, L, Q, R, S); the *ziqpu* star of gu XIII follows gu XIV, and that of gu XIV follows gu XV; and the *ziqpu* stars of sections M (after (gu XIII), P (after gu XVI), and T (after gu XX) do not fit into any "string." These peculiarities suggest that the compiler of the original used two sources: a list of *ziqpu* stars similar to that published by Schaumberger, but using somewhat different names for some stars, and a list of "strings" of stars that cross the local meridian more or less simultaneously. Probably in the original of the second

6. The *ziqpu* list utilized in our text contains the same stars, though often under different or corrupt names, as does that published by J. Schaumberger, "Die Ziqpu-Gestirne nach neuen Keilschrifttexten," ZA 50 (1952) 214-29. One parallel of this text (K.9794) came from Ashurbanipal's library. As our text does when an appropriate *ziqpu* star is missing, this text measures the time intervals between the *ziqpu* stars' meridian crossings in uš. Schaumberger suggests that this *ziqpu* text was drawn up in about the tenth century B.C. because its first star, α Boötis, would then have crossed the meridian at midnight of the day of the vernal equinox; this is not an overwhelmingly convincing argument.

7. Identifications of the star names in early texts, some of which must be changed in the light of our new text, are offered in E. Reiner and D. Pingree, *Babylonian Planetary Omens, Part Two: Enūma Anu Enlil, Tablets 50-51* (Malibu, 1981), pp. 10-16; see also the forthcoming edition of MUL.APIN by H. Hunger and D. Pingree.

8. The constellations are those listed in MUL.APIN I i 1-ii 35; many individual stars within those constellations are not attested to in MUL.APIN.

9. Except for a few coordinates of some *ziqpu* stars for which we have relied on Schaumberger, we have utilized two lists computed by A. Jones; one is a list of the coordinates of 519 stars for every 100 years from -1500 to +400 on the basis of the data presented by P. V. Neugebauer, *Sterntafeln* (Leipzig, 1912), and the second is a list of the coordinates of the stars that we identified as belonging to the GU text computed on the basis of the data given by F. Schlesinger and L. F. Jenkins, *Catalogue of Bright Stars* (2nd ed.; New Haven, CT, 1940).

list each "string" was headed by a time difference expressed in uš and/or danna. The confusion evident in the latter half of our tablet, then, would be due to the compiler's mechanical and incompetent conflation of the two sources; once he had dropped the "string" for gu X he was not able to restore the correct order to the rest of the text.

The nature of the text, which prescribes that all stars in a single "string" have approximately the same right ascension and that they are listed in order from north to south, allows us to realize that some Babylonian constellations (such as kak-si-sá) are of different configurations than have hitherto been recognized, and that some (such as dar-lugal) have previously been wrongly identified. It is also striking that the names of only a few stars within the constellations (primarily zodiacal) are found to be identical with those in Ptolemy's star catalogue;[10] the correlations are given in Table II. These, however, suffice to guarantee the general correctness of our identifications, though obviously not all of them.

The purpose of the hypothetical second source utilized by the compiler of this text, as that of the text itself, was probably to facilitate observations of the "longitudes" of the Moon and the planets. A string (gu) held taut in such a way that it seems to pass through or near the stars listed in any one section would provide a base line for determining the approximate right ascension of the Moon or a planet. If the string were permanently stretched in line with the local meridian as seen from a fixed observational post, the observer watching a planet cross the string could determine its approximate right ascension; its position would be defined by the number of uš by which it crosses the meridian-string before or after a proximate star belonging to one of the "strings."

The date of our text cannot be precisely determined; the same stars would lie close to the same meridian at any time in the first half of the last millennium B.C. We chose the date -700 primarily because that was the year for which Schaumberger computed the positions of the *ziqpu* stars. But this date is probably not very much in error. The arrangements of both the *ziqpu* stars and the meridian lines seem more advanced than the star catalogues of MUL.APIN; and the inclusion of the planets' "positions" (the Greek ὑψώματα) in the "strings" (Jupiter's in Cancer in gu V; Mercury's in Virgo in gu XII; and Saturn's in Libra in gu XIII) also points to a *terminus post quem* of either ca.-1000 (Saturn is called the Scales in MUL.APIN II i 64) or -700 (in the annals of Esarhaddon it is said that Venus reached its *niširtu* and Jupiter its *ašar niširtu* on the correct days in -679).[11] And our text, if the interpretation of its purpose suggested above is correct, is presumably older than either the introduction of the zodiac in the late fifth century B.C. or that of the standard reference stars in the late fourth century B.C.[12] Finally, one should remark that the use of meridians (or declination circles) inherent to our text may reflect the eventually Babylonian origin of Hipparchus' use of these same circles to determine the coordinates of the fixed stars[13]—a practice later adapted in India, where it continued to relatively recent times.[14]

10. On the identifications of Ptolemy's star-names see G. J. Toomer, *Ptolemy's Almagest* (London, 1984), pp. 341-99.

11. A full discussion of the data in the annals of Esarhaddon will be found in the commentary to MUL.APIN in the forthcoming edition of the text by Hunger and Pingree.

12. For these stars see A. J. Sachs, "Babylonian Observational Astronomy," in F. R. Hodson (ed.), *The Place of Astronomy in the Ancient World*, Philosophical Transactions of the Royal Society of London, A. 276 (London, 1974) pp. 43-50 (especially p. 46).

13. See, e.g., O. Neugebauer, *A History of Ancient Mathematical Astronomy* 1 (New York, 1975), pp. 283 and 340.

14. D. Pingree, "History of Mathematical Astronomy in India," *Dictionary of Scientific Biography* 15 (New York, 1978) 533-633 (especially pp. 565, 578, 610, and 625).

TABLE I

Stars	Classification	Identification	Right Ascension	Declination
	gu I (47°)[15]			
A 1. sipa-zi-an-na	Anu 8	β Ori.	46.87°	-15.07°
A 2. dar-lugal	Anu 10	μ Lep.	48.45°	-22.93°
	gu II (56°)			
B 1. front feet and hands of maš-tab-ba-gal-gal	*ziqpu* XVIII	θ Gem.	59.14°	+31.64°
		ν Gem.	57.82°	+16.98°
B 2. right hand and rear heel of sipa-zi-an-na	Anu	ξ Ori.	56.89°	+8.49°
		κ Ori.	55.46°	-14.51°
B 3. middle of dar-lugal	Anu	α Lep.	53.91°	-23.33°
	gu III (66°)			
C 1. rear foot of maš-tab-ba-gal-gal	*ziqpu* XIX	ξ Gem.	63.77°	+10.94°
C 2. maš-tab-ba-tur-tur	Enlil 6	ζ Gem.	66.08°	+19.52°
C 3. kak-si-sá	Anu 11	β Can. Mai.	66.31°	-20.32°
	gu for 76° missing			
	gu IV (86°)			
D 1. al-lul	*ziqpu* XX	ε Canc.	89.92°	+24.67°
D 2. muš	Anu 13	β Canc.	86.81°	+13.16°
D 3. ban	Anu 12	η Can. Mai.	84.52°	-27.29°
D 4. left foot of kak-si-sá	Anu	π Puppis	85.64°	-35.17°
	gu V (94°)			
E 1. 5 uš after al-lul			ca.95°	
E 2. Jupiter's position after al-lul and before ur-gu-la				
E 3. LU of kak-si-sá	Anu	ρ Puppis	93.23°	-19.80°
	gu VI (104°)			
F 1. two stars of the head of ur-a	*ziqpu* XXI	μ Leo.	106.83°	+35.13°
		ε Leo.	105.50°	+32.57°
F 2. middle of muš	Anu	θ Hydr.	102.61°	+9.90°
F 3. elbow of kak-si-sá	Anu	α Pyx.	104.01°	-26.31°
F 4. hands of nun-ki	Ea	γ Vel.	101.59°	-41.71°
	gu VII (113°)			

15. The first entry in GU I was probably *ziqpu* XVII β Aur. 43.07° +38.93°.

G 1.	four stars of the chest of ur-a	*ziqpu* XXII	ζ Leo.	113.77°	+33.79°
			γ Leo.	115.29°	+30.41°
			η Leo.	112.90°	+26.82°
			α Leo.	114.43°	+22.20°
G 2.	right front foot of ur-a	Enlil	π Leo.	112.99°	+17.92°
G 3.	middle of muš	Anu	κ Hydr.	112.58°	-4.98°
G 4.	nun-ki	Ea 3	λ Vel.	112.55°	-34.90°
		gu VIII (123°)			
H 1.	½ danna[16] after the four of its chest			ca.128°	
H 2.	foot in the middle of ur-a	Enlil	ρ Leo.	121.11°	+20.67°
H 3.	hand of nin-maḫ	Ea 4	φ Vel.	126.34°	-43.48°
		gu IX (132°)			
I 1.	two stars of the rump of ur-a	*ziqpu* XXIII	δ Leo.	130.01°	+33.33°
			θ Leo.	131.07°	+28.32°
I 2.	tail of uga	Anu	α Crat.	132.43°	-5.55°
I 3.	bite of giš-gán-ùr	Ea	μ Vel.	134.56°	-36.75°
		gu X (141°)			
J 1.	single star of the tail of ur-a The rest of gu X is missing[17]	*ziqpu* XXIV	β Leo.	141.04°	+28.51°
		gu XI (151°)			
J 2.	middle of uga	Anu	γ Corv.	150.18°	-3.04°
J 3.	hand of en-te-na-bar-ḫum	Ea	δ Cent.	150.95°	-36.22°
K 1.	e_4-ru_6	*ziqpu* XXV	γ Com.	150.14°	+42.85°
		gu XII (167°)			
K 2.	ab-sín	Anu 15	α Virg.	166.76°	+3.70°
K 3.	^{d}*šullat* and *ḫaniš*	Ea 7	ε Cent.	168.68°	-38.68°
K 4.	Mercury's position between ab-sín and uga				
L 1.	½ danna after e_4-ru_6			ca.166°	
		gu XIII (180°)			
L 2.	dingir-ku-a-meš	Enlil 22	ι Virg.(?)	179.59°	-8.28°
L 3.	front pan of giš-rín	Anu	λ Virg.	179.80°	+0.86°
L 4.	nu-muš-da	Ea 8	η Cent.	180.84°	-28.13°
L 5.	Saturn's position before giš-rín				
		NO FIT			
M 1.	*na-at-tul-lum*	*ziqpu* XXVI	υ Boöt.	174.06°	+30.44°
		gu XIV (192°)			
M 2.	middle of *zi-ba-nit*	Anu	β Libr.	194.40°	+3.29°

16. A reading "⅓ danna" would be preferable; this would indicate a right ascension of ca. 123°.

17. One might expect GU X to continue:

ξ Hydr.	141.61°	-18.09°
κ Car.	141.13°	-45.53°

M 3.	horn of gír-tab	Ea	γ Scor. = σ Libr.	189.23°	-12.06°
M 4.	eye of ur-idim	Ea	γ Lupi	193.51°	-28.73°
		gu XIII (180°)			
N 1.	šu-pa	*ziqpu* I	α Boöt.	182.60°	+33.36°
		gu XV (200°)			
N 2.	middle of *zi-ba-nit*	Anu	γ Libr.	197.98°	-2.69°
N 3.	stars of head of gír-tab	Ea	δ Scor.	202.57°	-11.39°
N 4.	middle of ur-idim	Ea	η Lupi	199.43°	-26.87°
		gu XIV (192°)			
O 1.	*na-at-tul-lum* 2	*ziqpu* II	ξ Boöt.	191.52°	+32.38°
		gu XVI (210°)			
O 2.	star of chest of gír-tab	Ea	α Scor.	208.50°	-16.41°
O 3.	tail of gír-tab	Ea	μ^1 Scor.	210.71°	-28.78°
O 4.	rear foot of ur-idim	Ea	ζ^2 Scor.	210.12°	-33.09°
		NO FIT			
P 1.	*kip-pat*	*ziqpu* III	α Cor. Bor.	205.12°	+38.28°
		gu XVII (220°)			
P 2.	eye of za-ba_4-ba_4	Anu	η Oph.	220.37°	-8.00°
P 3.	^{d}šár-ur ^{d}šár-gaz	Ea 12	λ Scor.	220.16°	-30.00°
			υ Scor.	219.46°	-30.03°
Q 1.	*šá maš-a-ti*	*ziqpu* IV	β Her.	218.97°	+30.44°
			γ Her.	216.15°	+28.61°
		gu XVIII (233°)			
Q 2.	middle of za-ba_4-ba_4	Anu	ν Oph.	233.42°	-5.02°
Q 3.	left hand of pa-bil-sag which is on the bow	Ea	δ Sag.	233.13°	-25.71°
Q 4.	má-gur_8	Ea 14	ε Sag.	232.44°	-30.29°
R 1.	*tak-šá-a-tú*	*ziqpu* V	δ Her.	231.46°	+31.16°
		gu XIX (241°)			
R 2.	knee of za-ba_4-ba_4	Anu	η Serp.	240.90°	+0.18°
R 3.	[right hand] of pa-bil-sag which is on the arrow	Ea	φ Sag.	239.74°	-24.52°
S 1.	single star of the knee of ùz	*ziqpu* VI	μ Her.	240.60°	+31.97°
		gu XX (251°)			
S 2.	foot of za-ba_4-ba_4	Anu	λ Aquil.	250.85°	-4.52°
S 3.	pa-bil-sag above má-gur_8	Ea	ι Sag.	250.60°	-43.09°
		NO FIT			

T 1.	crook of ùz	*ziqpu* VII gu XXI (265°)	α Lyr.	256.74°	+39.34°
T 2.	bright star of á-mušen[18]	Anu	α Aquil.	264.71°	+6.01°

TABLE II

Constellation	*Star*	*Babylon*	*Ptolemy*
Gemini	θ	front hands	left forearm of the advance twin
	γ	front feet	right foot of the advance twin
	ξ	rear foot	right foot of the rear twin
Orion	κ	rear heel	under right, rear knee
	ξ	right hand	in the right hand
Leo	α	of the chest	on the heart
	β	of the tail	on the end of the tail
	γ	of the chest	in the neck
	δ	of the rump	on the rump
	ε	of the head	in the head
	ζ	of the chest	in the neck
	η	of the chest	in the neck
	θ	of the rump	in the buttocks
	μ	of the head	in the head
	π	right front foot	on the left [front] knee
	ρ	foot in the middle	on the left armpit
Scorpius	α	of the chest	in the body
	γ	horn	
	δ	of the head	in the forehead
	μ^1	tail	in the second [last] joint
Sagittarius	δ	left hand on the bow	in the [bow]-grip held by the left hand
	φ	[right hand] on the arrow	just over the arrow

18. GU XXI may have continued:

T 3.	suḫur-maš	Ea	β Cap.	266.37°	-18.84°
U 1.	shoulder of ud-ka-du_8-a	*ziqpu* VIII	β Cyg.	265.64°	+25.60°

Benefic and Malefic Planets in Babylonian Astrology

F. ROCHBERG-HALTON

In Babylonian astronomical literature of the Seleucid period, the five planets are enumerated in the following sequence: ♃☿♀♄♂.[1] The same sequence is found in many astrological texts of the period, notably in the horoscopes.[2] This arrangement has nothing to do with a spatial arrangement of the planets in the cosmos, in contrast to the following planetary arrangement in Greek astronomy and astrology: ♄♃♂☉♀☿. The Greek model represents the order of the planets in depth according to their periods of sidereal rotation. No such "natural" explanation can be offered for the Babylonian sequence.

Boll noted the parallelism between an older (Neo-Babylonian) arrangement of planets—♃☉♀☿♂—and a Greek astrological doctrine of "terms" (ὅρια), or sections of zodiacal signs associated with planets, attributed to "Chaldeans" in the *Tetrabiblos* I, 21, 12-19.[3] But an explanation of the standard Seleucid enumeration of planets in terms of astrological doctrine was rejected by Neugebauer for lack of cuneiform sources to document the existence of such a doctrine.[4] Pingree, however, assumed the connection between the Babylonian sequence and astrology, and identified it with the attribution of benefic and malefic status to the planets, a theory well entrenched and abundantly documented in Hellenistic Greek (and Indian) astrology.[5] I present, in what follows, evidence from a Seleucid Babylonian astrological text, which leaves little doubt that a theory of benefic and malefic planets, similar in its main outlines to that in Hellenistic astrology, underlies the sequence in which the planets are enumerated in both Babylonian astrology and astronomy. This paper is offered in memory and honor of the enormous contribution of Abraham Sachs to our understanding of Babylonian astronomy and astrology.

1. This sequence was discovered by F. Boll; see *Paulys Realencyklopädie der classischen Altertumswissenschaft* 14 (1912) 2561 sub b, and "Neues zur babylonischen Planetenordnung," *ZA* 28 (1913) 350-51.
2. Published horoscopes may be found in Sachs, "Babylonian Horoscopes," *JCS* 6 (1952) 49-65.
3. See Boll, *Paulys Realencyklopädie* 14 (1912) 2561-64.
4. O. Neugebauer, *The Exact Sciences in Antiquity* (Providence, RI, 1957, 1969²), p. 169, and *A History of Ancient Mathematical Astronomy* (Berlin and New York, 1975), p. 604, (henceforth cited *HAMA*).
5. D. Pingree, *The Yavanjātaka of Sphujidhvaja* 2, Harvard Oriental Series 48 (1978), p. 214.

Explicit reference to the benefic and malefic natures of the planets in Babylonian astrology is provided in TCL 6 13, a Seleucid tablet from Uruk.[6] The relevant lines (obv. ii 1-4) are quoted below. Sachs drew attention to this particular section of TCL 6 13 since it closely parallels a number of nativity omens in TCL 6 14, which he discussed,[7] and further parallels are to be noted in a horoscope as well.[8]

TCL 6 13 ii

1 DIŠ MUL.SAG.ME.GAR GI-*át* SILIM-*át* NÍG.TUK U_4.GÍD.[DA DIŠ]
  ^{d}[*dil-bat pa-áš-ḫat at-rat e-ma* GIN-*ku* ŠE.GA U_4 GÍD.DA]
2 DIŠ $^{d}GU_4$.UD *qar-da-át e-tel-let e-mu-qan pu-ug-lu* DIŠ ^{d}[*Ṣal-bat-a-nu pít-ru-us na-an-ziq ḫa*]-⌜*an-ṭu-su*⌝
3 DIŠ ^{d}SAG.UŠ MI.MI *dal-ḫat* GIG-*at u si-qát*
4 DIŠ ^{d}30 ZALÁG-*at* SIG_5 *ki-na-at u* GÍD.DA // DIŠ AN.MI 30 *ek-let dal-ḫat* NU ZALÁG-*at* ⌜KIN NU GI DIŠ⌝ AN.MI 20 *par-sat pár-da-*<*at*>

Judging by the parallels, the protasis of TCL 6 13 has been abbreviated to DIŠ planet x, "if planet such-and-such," from an originally longer version, "if a child is born when planet such-and-such comes forth."[9] The apodosis contains a series of feminine statives describing the "sign" (*ittu*)[10]; although no birth is mentioned in the abbreviated form preserved here, the apodoses continue with predictions which must refer to the life of the native. I have translated as follows:

6. See my edition of this text in "TCL 6 13: Mixed Traditions in Late Babylonian Astrology," in *ZA* 77 (1987) forthcoming.

7. Sachs, *JCS* 6 (1952) 73-74; parallels found in TCL 6 14 obv. 19-33, see below, note 10.

8. MLC 2190 (dated to -234), see *JCS* 6 (1952) 60:7-12 and below, note 10.

9. Cf. TCL 6 14:27-36, see *JCS* 6 (1952) 66.

10. The first statement, namely DIŠ MUL.SAG.ME.GAR followed by two feminine statives and an omen apodosis, can be seen elsewhere in astrological texts in a fuller form. The passage can be identified in nativity omens, TCL 6 14:29, see *JCS* 6 (1952) 66 (translation of Sachs is quoted here): (LÚ.TUR *a-lid-ma* ^{d}SAG.ME.GAR È-*a* GI-*át* DI-*át* NÍG.TUK SUMUN-*bar* U_4 GÍD.DA, "If a child is born when Jupiter has come forth: regular, well, he will become rich, he will grow old, (his) days will be long," and in a horoscope for the year -234, MLC 2190: 7f., see *JCS* 6 (1952) 60 (translation Sachs): (KI MÚL.BABBAR GI-*át* DI-*át* NÍG.TUK SUMUN-*bar* U_4.MEŠ GÍD.DA.MEŠ, "Place of Jupiter: regular, well, riches, he will grow old, (his) days will be long." The text in question (TCL 6 13) is clearly a repetition of the same omen, which associates Jupiter with particular predictions. The subject of the stative verbs seems to have been lost by ellipsis, but it should be feminine in agreement with the many feminine statives that occur in this section (e.g., *šalmat, dalḫat, marṣat, sīqat*). Since the same phraseology with the subject expressed occurs on the reverse of the tablet (see e.g., rev. ii 3: GISKIM.BI TAG-*át*, "its sign is bad"), I suggest supplying *ittu* "sign" as the feminine subject. Thus, the apodoses describe first the nature of the sign (when a child is born and a certain planet is seen) and then personal predictions follow.

11. Note the parallels in which "omen" is expressed by *têrtu*: *têrtum šalmat* (written syllabically) *JCS* 11 (1957) 95b passim (OB) and *têrtum* (*ul*) *šalmat* (written GI-*at*) *CT* 20 44/8 passim). And also [ḪAR].MEŠ-*šú* (*têrētišu*) *dalḫa*, "his (the sick man's) omens are confused (BAM 316 ii 11).

1 If Jupiter: (the sign) is favorable (*šalāmu*),[11] . . . ; wealth and long days (are in store).
  If Venus: (the sign) is calm, . . . ; wherever he goes good fortune, and long days (are in store).
2 If Mercury: (the sign) is heroic, lordly; great strength[12] (is in store).
  If Mars: (the sign) is ambiguous; (he will be) quick to anger.
3 If Saturn: (the sign) is dark, disturbed; sick and constrained.
4 If the moon: (the sign) is bright, good; true and long(lived?).
  If the eclipsed moon: (the sign) is dark, disturbed, not bright; no true omen.
  If the eclipsed sun: (the sign) is divided; confused; longevity (is in store).

The system represented here identifies the planets Jupiter, Venus, and Mercury as benefic (lines 1-2), and Mars and Saturn as malefic (lines 2-3).[13] The moon is considered benefic, but when eclipsed it is malefic (line 4). The sun is mentioned only as eclipsed, in which case it is said to be "divided" (*parsat*) and no personal predictions are associated with it (line 4). In addition to the explicit designation of the planets as benefic or malefic in the section obv. ii 1-4, the theory is integrated with a simple binary schema which determines a good prediction if a benefic shines brightly and a bad prediction if a malefic shines brightly. Conversely, a bad prediction is made if a benefic is dim. The following examples serve to illustrate the schema: TCL 6 13 ii 15-16 (benefic, bright = favorable): BE-[*ma*] *ana* GABA.RI GISKIM.MEŠ *an-na-a-tú* ^{d}SAG.ME.GAR *ma-gal* GUR_4 30 *u* 20 *ina* KI KUR.URI.KI NU ⌜R.MEŠ KÚR ZI-*ma* NAM.RI NU È, "if opposite these signs, Jupiter is very bright, neither moon nor sun will be eclipsed in the place of Akkad; the enemy will attack but will not take booty"[14]; obv. ii 17 (malefic, bright = unfavorable): ^{d}*Ṣal-bat-a-nu ina* ⌜R.TAB UŠ-*ma* GUR_4 ZI *su-tí-i*, "Mars is stationary in Scorpius and is bright: Attack of the Suteans."[15] The last example, obv. ii 20, shows an unfavorable outcome when a benefic is dim: ^{d}SAG.ME.GAR SIG NAM.RI È, "Jupiter is dim: booty will be taken."[16] There are no exceptions to the schema in any omens of the text.

Similarly, in reverse ii, when the benefics are standing in the "DUR"[17] and are bright, it is favorable "for the land," that is, Babylonia, as in line 7, while when benefics are not present (or are faint) the outcome is negative, as in lines 8, 15, and 16. When malefics are present and bright, the omen is unfavorable, as in lines 5 and 6.[18] The last section of the text (rev. ii 11-28)

12. Perhaps emend to *pu-uq-*<*qu*>*-lu*, since the adj. is derived from the D-stem of *paq/kālu*, see *AHw* 2 875a. See *CAD emūqu* 1c for this expression, frequently said of gods.

13. The Greek astrological tradition also takes Jupiter and Venus as benefics, and Mars and Saturn as malefics. Mercury, however, is viewed as having ambiguous status, as it can sometimes be benefic, sometimes malefic. See Ptolemy, *Tetrabiblos* 1.5-7 (ed. F. E. Robbins; Loeb Classical Library, [1980], pp. 38-39). See also Bouché-Leclercq, *L'Astrologie grecque* (Paris, 1899; repr. Scientia Verlag Aalen, 1977²), p. 101 n. 2. The same is found in Indian astrology, see Pingree, *Yavanajātaka* 2, p. 109 and pp. 241-42.

14. Cf. also obv. ii 18.

15. Cf. also ii 19f. and 22f.

16. Cf. also ii 22 and 24.

17. DUR (*riksu*) "bond" is a technical term found in late Babylonian astrological texts dealing with planets. Nativity omens for a child born when a planet stands "*ana* DUR" are attested in TCL 6 14 (see *JCS* 6 65ff). For other occurrences of DUR in astrological texts, see *LBAT* 1589 ii 5′ and 10′ (nativity omens based on planetary phenomena at the time of conception of a child, for example, [line 10] *šerru reḫi ina* DUR-*šú Dilbat rabi*, "a child is conceived; Venus sets heliacally in its DUR"); *LBAT* 1596:11-14; TCL 6 13 rev. passim. In light especially of TCL 6 13, DUR may mean some configuration or relation involving several planets (usually 3), but this is still highly uncertain. More contexts in which DUR is used are required for a better understanding of the meaning of the term.

18. See my article, "TCL 6 13: Mixed Traditions in Late Babylonian Astrology," *ZA* 77 (1987). The binary schema of interpretation based on brightness (GUR_4) and dimness (SIG) is seen elsewhere in late Babylonian astrology as well.

demonstrates the systematic association of good or bad signs with certain planets. Further reference to the pairing of the benefics Jupiter and Venus, and the malefics Saturn and Mars, but without specific reference to their benefic or malefic association, is found in other late Babylonian zodiacal omens.[19]

The evidence of TCL 6 13 strongly supports the explanation, assumed by Pingree,[20] which attributed the Babylonian planetary sequence to the grouping of benefics Jupiter and Venus (and, in TCL 6 13, Mercury is also apparently considered benefic) on the one hand, and malefics Saturn and Mars on the other. TCL 6 13 does not reproduce the standard Seleucid arrangement exactly, but reverses the order of the two malefics as follows: ♃♀☿♂♄.[21]

Many examples of the enumeration of planets and their positions in the zodiac are to be found in horoscopes, which aimed to determine planetary positions on a given birthdate. An inspection of the sequence in which planetary positions are given in roughly thirty horoscopes, spanning the fifth to the first centuries B.C., shows that after ca. 250 B.C. the planetary sequence employed in these texts is that of the standard Seleucid arrangement (♃♀☿♄♂).[22] Only one horoscope, for the year -287, uses the NA/NB sequence (♃♀♄☿♂).[23] The sequence of the fifth century example[24] is difficult to identify, since Mercury is recorded as "not visible (NU IGI)," causing its displacement to the end. The practice of writing the invisible planets at the end following the zodiacal positions of the others continued throughout the Seleucid period. Another variation of the standard sequence resulted if two planets occupied the same zodiacal sign, in which case they would be written together as a pair. The standard order of enumeration was altered only in accordance with the two conventions just described.

Unfortunately, the connection between the order of planets and their identification as benefic or malefic cannot be shown in horoscopes. Since no personal predictions are given, such correlations cannot be made. Based on the dependence of horoscopes upon other astronomical records (especially almanacs) for their planetary (and lunar) data, it seems to me that horoscopes follow the standard enumeration sequence simply because that is the convention followed in their astronomical sources.[25]

Some additional support for the Babylonian association of planets with particular "qualities" such as beneficence or maleficence may be adduced from the celestial omen series *Enūma Anu Enlil* and its Old Babylonian forerunners. The evidence is convincing in the case of Mars, which appears in the apodosis of lunar eclipse omens as a maleficent planet, responsible for the death of cattle. Whether it is even possible to derive a profile of the other planets will depend upon detailed study of the apodoses of planetary omens. For the present, the following examples for Mars must suffice: OB text A (=BM 22696) obv. 23, (lunar eclipse on the 16th of Nisannu): [*Ṣa-al-b*]*a-ta-nu-um i-ta-ab-bi-am-ma bu-lam ú-*[*ḫal-la-aq*]*-ma*, "Mars will rise and destroy the herd" (dupl. BM 86381 i 23: *Ṣa-al-ba-ta-nu i-ta-bu-ma bu-lam ú-ḫal-la-aq*.) This omen enters the canonical tradition in *Enūma Anu Enlil* 17 as follows: ([DIŠ UD.15.KAM AN.MI GAR . . .]) [^{d}*Ṣal-bat*]*-a-nu* SAR-*ma bu-lum* ZÁḪ.[26]

19. See my "New Evidence for the History of Astrology," *JNES* 43 (1984) 123-25 and table 2.

20. Pingree, *Yavanajātaka* 2, p. 214, and compare p. 241.

21. The same sequence as in TCL 6 14 (see *JCS* 6 (1952) 66:29-33, 37-39, and passim), whenever the planets are enumerated.

22. This and the following observations are based on an edition I am preparing of the horoscope texts. Published examples of horoscopes are available in Sachs, *JCS* 6 (1952) 40-75.

23. BM 33382 (=*LBAT* °1459).

24. Horoscope for the year -409, AB 251, published *JCS* 6 (1952) 54f.

25. For a discussion of the sources of the horoscopes, see my "Babylonian Horoscopes and Their Sources," (*Or*NS, forthcoming).

26. *Enūma Anu Enlil* 17 source E r. 4, dupl. source G 13, and cf. source D ii 5; see my edition to be published in *AfO* Beiheft 22.

The question remains, however, why the "astrological" arrangement of planets was ever adopted in the astronomical texts. The astronomical sources in which the standard planetary sequence is found are the non-tabular astronomical texts, which were classified by Sachs into the groups Goal-Year texts, Almanacs, Diaries, and Excerpts.[27] This vast body of material, numbering approximately 1400 tablets, is sometimes referred to with the abbreviations NMAT (non-mathematical astronomy texts, to distinguish them from ACT ephemerides and procedure texts[28]) and sometimes GADEx (after Sachs' typology[29]). Among the GADEx texts, the Goal-Year texts and Almanacs are the text types which rigorously employ the planetary sequence seen in the horoscopes.[30] A Goal-Year text concerns a given year (the "goal-year"), and provides data based on the periods of each planet and the moon. For the prediction of planetary and lunar phenomena in the goal year, the text provides phenomena which occurred one period (appropriate to the particular celestial body) preceding the goal year, so that for Jupiter, the data precede the goal-year by 71 years, or for the moon, by 18 years. The periods used in Goal-Year texts are the well-known synodic periods of the planets.[31] One paragraph is devoted to each planet and the arrangement of the paragraphs is in accordance with the Seleucid order of planets. Goal-Year texts appear to be intimately related to the Diaries, which probably provided the ultimate observational data.

Almanacs exhibit less of a connection to Diaries; indeed, the planetary data are entirely computed and contain no observational remarks such as are occasionally found in Goal-Year texts.[32] Almanacs provide information on the location of the planets in the zodiac at the beginning of each month for one Babylonian year, and the dates of their entries into the next sign. Such data is extremely useful for the construction of horoscopes, which require the location of planets in the zodiac on an arbitrary date (the date of birth), not necessarily corresponding to a date of a synodic appearance (which is what is predicted in the ephemerides.)

Clearly, the language—by which I mean technical terms—and orthography of horoscopes, diaries, almanacs, ephemerides and procedure texts, and also of celestial omens of the late period, have a common base. It is also well-known from the colophons of ephemerides (in *ACT*) that some copyists of astronomical texts bore the professional title "scribe of Enūma Anu Enlil" (LÚ.UMBISAG DIŠ.U$_4$.DIŠ.*En-líl-lá*).[33] The shared technical terminology and even professional title suggest that despite the rigorous adherence to and maintenance of separate genres of astronomical (and astrological) records, the training and interests of the scribes in both these areas very likely stemmed from one intellectual tradition. In view of this, it should come as no surprise to find the same convention for enumerating planets in astronomical as in astrological texts.

But with regard to the two attested planetary sequences, Neo-Babylonian and Seleucid, it is worth mentioning in addition that these conventions also occur in contexts neither strictly astrological nor astronomical. In the seventh century, for example, the invocation of planets in

27. A. Sachs, "A Classification of the Babylonian Astronomical Tablets of the Seleucid Period," *JCS* 2 (1948) 271-90.

28. A. Aaboe, "Observation and Theory in Babylonian Astronomy," *Centaurus* 24 (1980) 15.

29. Neugebauer, *HAMA*, p. 351.

30. For texts, see *LBAT*.

31. Neugebauer, *HAMA*, p. 554 and n. 8.

32. Diaries are not exclusively observational in character either; see *JCS* 2 (1948) 287 sub 53.

33. See Neugebauer, *Astronomical Cuneiform Texts* (Princeton and London, 1955), pp. 13-15. This, however, is not proof that the two disciplines astrology and astronomy should be conflated as being one and the same; and I reiterate Neugebauer's observation that "the appearance of a scribe called 'astrologer' in the colophon of a tablet does not necessarily determine its content as astrological or astronomical" (*ACT*, p. 14).

oaths, as attested in the vassal treaties of Esarhaddon,[34] occurs as ♃☿♄☉♂, which is the Neo-Babylonian arrangement discovered by Boll. In the Seleucid period, a ritual requires that a libation of water for washing the hands be offered to "Jupiter, Venus, Mercury, Saturn, Mars, Moon, and Sun,as soon as they appear.[35] Lastly, the tablet expressing celestial omens in numbers appends a section listing the five planets in the standard Seleucid order.[36] The date of this text (or its source) is somewhat in doubt.

Regardless of textual genre, therefore, the planets were enumerated by convention. In my view, that convention was originally shaped by the underlying astrological schema identifying planets as either benefic or malefic. As I have shown, the evidence from TCL 6 13 offers strong support for the existence of such a schema in the late period, the bare traces of which are already found in apodoses of *Enūma Anu Enlil* and its Old Babylonian forerunners. The astronomical texts in which the "astrological" planetary sequence is employed, however, are no more closely connected to astrology by virtue of their use of the conventional sequence than they are by their use of the same spellings of the planets' names. The relationship between astronomical and astrological texts must be seen rather as one defined in terms of goals and methods. For the same reasons that it became necessary for the ancients to differentiate astrological and astronomical inquiry in various textual genres, historians ought similarly to differentiate between the specific goals and methods of these two ancient scholarly disciplines.

34. D. J. Wiseman "The Vassal Treaties of Esarhaddon," *Iraq* 20 (1958) 13ff. Cf. the oath in Parpola, *Letters from Assyrian Scholars to the Kings Esarhaddon and Assurbanipal*, part 1: Texts, AOAT 5/1, rev. 18-19 and 13:11-11. And see above, n. 3.

35. TCL 6 41:23f.; see Thureau-Dangin, *Rituels accadiens*, pp. 68 and 119, also translated by Sachs in *ANET*², p. 338.

36. Hunger, "Kryptographischen astrologische Omina," AOAT 1, pp. 139ff.

Shunukhra-Khalu

JACK M. SASSON

. . . l'arithmétique mène à la philologie,
et la philologie au crime . . .
Ionesco, *La leçon*

This paper, dedicated to the memory of Abe Sachs, will pick up Ionesco's trajectory midway and thereby hope to alter its grim prediction. Its subject, Shunukhra-Khalu,[1] has received his share of attention from specialists, most often, however, when they comment on this shadowy yet influential person in Zimri-Lim's court.[2] I want to use this opportunity to fulfill three tasks: first, to update the career of this official now that we have about him many more dated texts and then to review the corpus of letters in which he is a correspondent. Finally, since some writers occasionally communicate similar topics when writing the king, I will also try to gauge the different language and tone they adopt when addressing two levels of authority.

The meaning of the name "Shunukhra-Khalu" is still not satisfactorily explained. A division into two segments is clearly indicated by comparison with a Terqa name, Shunukhra-Ammu,[3] and by variant spelling of the name.[4] The meaning "maternal uncle" for the second segment of the name, is not in dispute, although there is reasonable ground to debate whether or not *ḫālum* is a divine epithet. I have capitalized that element in my normalization of the name to indicate that it is indeed so; but I am not attached to this interpretation. As for the first element, Huffmon has reviewed the major opinions, without coming to a conclusion.[5] And this is where this matter now stands.

1. I would like to express my appreciation to D. Charpin for sending me his treatment of a number of letters addressed to Shunukhra-Khalu soon to be published in the Archives Épistolaires de Mari series, volume 1.

2. Oppenheim, "A Note on the Scribes in Mesopotamia," in Güterbock and Jacobsen, eds., *Studies in Honor of Benno Landsberger on his Seventy-fifth Birthday, April 21, 1965*, Assyriological Studies, 16 (Chicago, 1965), pp. 553-56, featured a letter addressed to Shunukhra-Khalu in his study of royal secretaries. I collected the information then known about him in "Some Comments on Archive Keeping at Mari," *Iraq* 34 (1972) 57, and Rouault and Pack did the same, respectively, in 1977 (ARMT 18, p. 254 n. 121) and 1981 (*The Administrative Structure of the Palace at Mari* (ca. 1800-1750 B.C.). [Unpub. Ph.D. Dissertation, University of Pennsylvania, 1983.] Ann Arbor: University Microfilms International. [Order No. 8127058], pp. 411-413). Durand's recent remarks in "Les dames du palais de Mari à l'époque du Royaume de Haute-Mésopotamie," M.A.R.I. 4 (1985) 400-401 will be discussed below.

3. Cited by Huffmon, *Amorite Personal Names in the Mari Documents*. (Baltimore, 1985), p. 268.

4. See Birot, ARMT 16/1 200, to which add the spelling *šu-nu-ru-ḫa-lu* of ARM 22 237:21, a spelling which may be compared to *šu-nu-ur-ḫa-li* of *Altbabylonische Briefe* 2 22:4, 2'.

5. Gelb: a quadriliteral of unspecific meaning; Albright: a *sha'fel* from *na'arrurum*. See Huffmon, *Amorite Personal Names in the Mari Documents*, p. 268.

I. ECONOMIC AND ADMINISTRATIVE DOCUMENTATION

A. PRE-"ASSYRIAN" PERIOD

If we are not dealing with homonyms, Shunukhra-Khalu may have been an official before Shamshi-Adad installed his son on the throne of Mari. ARM 22 81 lists 6 categories of personnel, 28 members in all, who belong to "Shunukhra-Kha[?]'s household (*bītum*), the one in *Li*[*x*]*bim*^{ki}." Unfortunately, I do not know where that town is located, but it is reasonable to think it close to the capital. The vocabulary used in this text may indicate that other localities may harbor other domestics of Shunukhra-Khalu. However, the remaining documentation on Shunukhra-Khalu, whether or not provided with a date, comes from the reign of Zimri-Lim.

B. ZIMRI-LIM PERIOD

a. Seal: Shunukhra-Khalu's seal is not very informative, declaring him to be Zimri-Lim's servant.[6]

1. *Dated Documents*

b. Zimri-Lim 1′ (11.xi). ARM 22 237: Various amounts of gold, the weight of precious artifacts belonging to the goddess Diritum, are delivered for processing. The transaction probably took place in Der. The following is the order of officials: assigned (si.là) to 2 men, inspected by (*ebbūt*) 2 other men, and supervised (gìr) by Mashum, Ipiq-Addu, the lapidary Idin-Ishtar, and *šu-nu-ru-ḫa-lu* (sic).

The year Zimri-Lim 1′ was filled with martial activities, and the documents belonging to its eleventh month indicate that a considerable amount of work is assigned to artisans.

c. Zimri-Lim 4′ (26.i). S. 143 No. 69[7]: clothing and footwear, withdrawn from storage under (zi.ga nìg.šu) Mukannishum; supervised by (gìr) Shunukhra-Khalu.

d. Zimri-Lim 4′ (30.ix) ARM 25 233: Gold to make jewelry, handed over to Yashub-ashar in Mari; supervised by (gìr) Darish-libur and Shunukhra-Khalu.

The year Zimri-Lim 4′ saw much activity, in particular, many transactions in goods coming from and going to foreign nations.[8]

e. Zimri-Lim 6′ (11.viii) ARM 24 112 rev 5′: The damaged document probably dealt with clothing. Shunukhra-Khalu is listed as supervisor (gìr), together with Darish-libur and Mukannishum, the activity taking place at the bureau of the palace's gate. Darish-libur very likely occasionally travelled with the king, perhaps as his chief valet. Yet it is Darish-libur who is assigned the task of readying the king for news of his daughter's death (ARM 10 106).

The records for this month are spare and not particularly revealing.

—[ca. Zimri-Lim 6′-9′ Inib-sharri's correspondence, letters n.-p.]

6. Dossin, "Secrets d'état . . . ," *Akkadica* 25 (1981) 256; Beyer, "Scellements de portes du palais de Mari," M.A.R.I. 4 (1985) 378 and note 8; 380.

7. Cited by Rouault, ARMT 18 109.

8. See Sasson, "'Year: Zimri-Lim Offered a Throne to Shamash of Mahanum'; An Overview of One Year at Mari. Part I: The Presence of the King," M.A.R.I. 4 (1985) 437-452.

f. Zimri-Lim 9′ (?.iv?) ARM 23 541:15: Compilation of clothing exchanged with foreign kings during two years. Fragmentary, mentioning *šūbultum* that is supervised (gìr) by ShunukhraKhalu.

The transaction may have taken place when Zimri-Lim travelled toward Aleppo, Shunukhra-Khalu probably accompanying him.

—[Zimri-Lim 9′ or 10′. Letters w, w′. from Yasim-sumu's dossier; Letter from Shadum-labuwa, see text l]

g. Zimri-Lim 10′ (27.x) ARM 23 217:3: "18 jars of reddish wine, 12 jars of honey, which Shunukhra-Khalu brought back from Aleppo." The document further records the purchase of lesser quality wine from Carchemish and elsewhere which was ultimately stored in Terqa and Saggaratum. The text makes three matters clear:

1. Shunukhra-Khalu did not purchase his consignment, but probably received it as gift when accompanying his king to Aleppo;

2. Shunukhra-Khalu's wine was of premium quality, the purchased wine was not;

3. Shunukhra-Khalu did not have to relinquish to the palace control of his supply, but probably kept it for his own household (see also m).

—[Zimri-Lim 10′ff.: Letters from Yamṣium/Yamṣûm, texts bb., cc.]

—[Zimri-Lim 10′ff.: Letters from Yarim-Addu, text q.]

2. *Texts without a Date* (lost or unplaced)

h. S. 52 no. 128 catalogued by Rouault as "liste de noms propres très abîmée." (ARMT 18, p. 103). In his index, p. 265, Rouault writes that this document includes Shunukhra-Khalu's name.

i. ARM 21 428:2 A fragmentary text that speaks of cattle feed (*tabrû*) grown in land, a portion of which belonged to Shunukhra-Khalu. Charpin is to publish a corpus of similar documents.

j. ARM 21 83 (cf. S. 133, N. 179, *apud* ARM 21, p. 96, n.1). Apportionment of meats and fish, under various supervision. Lines 15′-17′: "70 units of fish, 20 baskets of fish, under the supervision of (gìr) Tamkhirish-Khebat and Shunukhra-Khalu." Tamkhirish-Khebat was a mid-level official in the Mari palace. He is the person who communicated ARM 10 106 to Darish-Libur (see above, e).

k. ARM 22 229 accounts for two separate collections of copper scythes belonging to the palace and to various temples. The second of these has the following summary:

> Total: 13 copper scythes which Mukannishum removed from the "bitumen storehouse." Shunukhra-Khalu has [. . .] in conformity with the requirement of this tablet.

The above listings suggest the following about Shunukhra-Khalu:

1. The pre-"Assyrian" material aside, we can follow his career from Zimri-Lim 1′ almost through Zimri-Lim 10′. Since we have no evidence to the contrary, we presume that Shunukhra-Khalu retained his prominence throughout Zimri-Lim's reign.

2. He owned land (i) upon which cattlefeed is raised. He probably had a household which he supplied with his own personal purchases when travelling abroad (f).

3. As far as Shunukhra-Khalu's function is concerned, the administrative documentation is unanimous (b-f, j) in using the label gìr for it. I have used the verb "to supervise" for the term although, with Pack,[9] I recognize that its meaning covers various forms of responsibility: reception, control, officiating, and the like. Particularly in the case of (f), the linking of gìr with

9. Pack, *Administrative Structure*, pp. 10-59.

šubultum may mean that Shunukhra-Khalu was actively engaged in the transportation of various gifts to be parcelled out by Zimri-Lim.[10]

Here too we may note that in his gìr capacity, Shunukhra-Khalu is either listed alone (f) or with other palace personnel, among whom were the *šatammum* Mukannishum as well as Darish-libur (d-e), Tamkhirish-Khebat (j) and Mashum (b). That he worked closely with Mukannishum is also clear from (c) and (k).

II. EPISTOLARY EVIDENCE

The above portrait for Shunukhra-Khalu drawn from administrative documents does not prepare us for the eminence reflected by the epistolary sources. Although the Mari records do contain letters written by Shunukhra-Khalu, those published so far are sent to him: A. by a foreign ruler, B. by members of the royal family, C. by subordinates, D. by palace officials, possibly subordinates, and E. by colleagues who are highly placed in Mari administration.[11]

A. FOREIGN CORRESPONDENCE

1. *Letter from Shadum-labuwa, king of Ashnakkum*

l. B.179[12]

I am well; do send me news of your well-being. Another matter; send me scented oil, the kind I use regularly to anoint myself, and balm of cypress. As for you, write to me about whatever you desire that I may send it to you.

We know that on 13.ix.8′ Sammetar was still king at Ashnakkum (ARM 24 308). D. Charpin kindly informs me of evidence placing his death in Zimri-Lim 9′. Shadum-labuwa is recorded as king of that town in other documents. S. 52 no. 45 (ARMT 18, p. 108) dates one of his transactions with Mari to 4.x.10′ and another (ARM 23 54) to 19.xi.12′.[13] ARM 2 33 indicates that he was active at about the time Zimri-Lim sent his forces to help Babylon against Larsa (Zimri-Lim 9′-10′). There is a good chance, therefore, that this letter comes anytime after Zimri-Lim 9′. That Shadum-labuwa began his career as a Mari official is a plausible conjecture, and it may explain the friendly demands he makes upon Shunukhra-Khalu.

Laconic though it may be, this note from Shadum-labuwa reinforces the perception from text (g) that Shunukhra-Khalu does indeed amass material goods for his personal benefit.

10. Pack, *Administrative Structure*, pp. 21-23.

11. I admit that I discriminate to some degree artificially between the last two categories.

12. Jean, "Pharmacopée et parfumerie dans quelques lettres de Mari," *ArOr* 17 (1949) 329.

13. Only two other published documents are dated in Zimri-Lim's reign later than this text possibly ARM 21 147 (20.xi.12′) and M.11500 , Durand, "Sur un emploi du verbe *bulluṭum*," M.A.R.I. 3 (1984) 262.

B. CORRESPONDENCE WITH MEMBERS OF THE ROYAL FAMILY

1. *Letter from Beltum*

m. ARM 10 29 + M. 10725[14]

[4-11a] I have seen the general and, together with my female companions, I have proceeded toward the convent (?), thinking, "I want to reach my 'star' and Shunukhra-khalu, my son." But since they confined Sin-ashared within town, I wrote to the village the following, "I fear that they may turn back my servant-girls."

[11b-23a] He brought in his wife and his older (?) sons in preference to my household and your young servants. Me, moreover, he does not love, having failed to provide me with a servant girl to wash my feet. He has seized my companions, their [goods], their servant girls, and their utensils. I thought, "let me grab a single frock, and get to the house of my father and 'star'!"

[23b-27] Therefore, please give strict orders to the general for him not to neglect my case. Further, send toward me a young female servant as soon as you learn of my voyage (toward you).

Beltum, labelling herself as "your mother," writes Shunukhra-khalu about her trek to the *guparim*, which may be a convent, but more probably is a quarter within Mari, but outside its palace. The burden of her message is framed within repetitions of her resolve to reach her "star." She writes of her complaints against someone (the general, Sin-ashared [?], someone else?) who seems to favor his own family rather than hers; she complains about the affront to her dignity and position.

The issues raised by this letter are: who is Beltum and what is her relationship to Shunukhra-Khalu?

Durand[15] has collected and studied a group of letters with a major female personality named Beltum. In Mari, the noun, *bēltum* is applied to divinities (mostly) and to the reigning queen. In treating the examples from the Zimri-Lim period, however, we can distinguish among four categories:

a. *bēlet mātim*, preceded by mí, and used in letters by a woman when referring to herself (for example, ARM 2 117; ARM 10 20, 28). *Bēlet mātim* is clearly a personal name (and not a title), referring to an official who lived away from Mari.[16]

b. *bēltum*, who corresponds with officials of the king (for example, ARM 10 152-155; 157-164). In these cases, the 1ps suffix is invariably linked to *bēltum*. In all instances, the context for these letters make it clear that they address a queen, very likely Shiptu. In one case (ARM 10 161, Room 171!), *bēltum* is not preceded by mí. Finally, in ARM 10 153, Kibri-Dagan addresses the queen as ^{mi}*bēltim* (but compare lines 7, 10).

c. *bēltum*, undeclined and not preceded by mí, as used by the sender of a letter. Durand's collations of the letter given above has a mí preceding Beltum. It is not clear to me, as it seems to be to Durand, that the *bēltum* (without mí!) who receives ARM 10 43 necessarily refers to the

14. Translation, Dossin, ARMT 10, pp. 57/9. Durand's collations, and transliteration are given in "Les dames du palais de Mari à l'époque du Royaume de Haute-Mésopotamie," M.A.R.I. 4 (1985) 401 n. 103. Translation and discussion are given in the same, pp. 400-401.

15. Durand, M.A.R.I. 4 (1985) 398-407.

16. Cf. Durand, M.A.R.I. 4 (1985) 420. However, we are still in the dark on why Belet-matim does not call herself "your servant" or the like. Perhaps we are dealing with a homonym of the king.

same person, granted that the uninflected forms in both suggest a relationship between them; but given the context of ARM 10 43, I think an alternate explanation can be offered for the use of *bēltum* there.

Despite Durand's[17] remarks, Ereshti-Aya is still likely to be Zimri-Lim's daughter; but when she writes a frigid letter to her father's (new) wife, Shiptu, she underscores the title "*the* lady," rather than demonstrate her submissiveness by using "*my* lady (*bēltī*)."[18]

d. We are left, therefore, to contend with our letter as so far the only epistolary instance wherein a woman *named* Beltum is at stake. This leads us to examine the administrative archives.

I know of the following occurrences in administrative texts of *bēltum*, when undeclined and preceded by the mí-sign:

i. ARM 25 617: materials for/from Beltum, Shiptum, Khaliyatum and Yatar-aya; the last three are wives of Zimri-Lim (19.ix.3′);

ii. ARM 23 218: an ox, gift of the palace, when Beltum does something (QAR.NI. . . *úš-bu*) in Annunitum's temple, 3.xi.7′;[19]

iii. ARM 24 24: an ox, gift of the king, when Beltum [went to] G/DN . . . , 3.viii.10′;

iv. ARM 24 223: fragmentary list, with Khaliyatum, Manatan, Beltum, Warad-ilishi and Ṣidqi-Epukh listed in that order;

v. ARM 23 223 where animals and goods are given as donation, in the king's presence, by the following *officials*: Idin-Dagan, Beltum, Bur-nunu, Manatan, Zimri-Addu, Puzur-Addu, Dagan-shaduni, and Darish-libur.

vi. ARM 25 746:15: silver distributed to diverse personnel. Beltum's name, however, occurs outside this series and I do not understand her connection to the others.

e. *bēltum*, declined, with or without the mí-sign, in administrative texts. The material collected by Durand should suffice to show that the term commonly referred to the reigning queen.[20]

The above selection of materials allows me to speculate that during Zimri-Lim 3′-10′, and presumably throughout Zimri-Lim's reign, there was a mid-echelon female official by the name of Beltum. ARM 23 218 and ARM 24 24 indicate that she maintained a sacerdotal function, for which the palace contributed offerings. Durand has cited a number of documents from the "Assyrian" period wherein a "Beltum" seems also to be a Yasmakh-Addu queen, and this is now confirmed in a passage quoted by Charpin.[21] Whether or not this woman is the Qatna princess who marries Yasmakh-Addu is debatable; but it may well be that the Beltum in Zimri-Lim's archives was a daughter of Yakhdun-Lim and, being such, she elicited respect at all times before Mari's fall.

Whichever conjecture pleases, we should perhaps take very literally the greeting, "your mother," with which Beltum began the above letter to Shunukhra-Khalu. If so, we will be able to understand why Shunukhra-Khalu was so well placed in Mari: a son of one of Yakhdun-Lim's daughters, he would be Zimri-Lim's "nephew." The label "star" for Zimri-Lim is not an impossible vocabulary for a sister of a king.[22]

17. Durand, M.A.R.I. 4 (1985) 400.

18. On this letter, see also the remarks of Veenhof, "Observations on some Letters from Mari (ARM 2 124; 10 4; 43; 84; 114) with a Note on *tillatum*," *RA* 76 (1982) 133-34.

19. For this construction, see also ARM 22 276 i 40 (intake of sesame, from various places): *inūma* lugal *qila²ūtim ušbu*.

20. Add ARM 25 624 (22.vi.Zimri-Lim 7′), where the queen and other palace personnel receive gifts from Sharraya of Razama.

21. *NABU* (1987) 116.

22. On the daughters of Yakhdun-Lim, see Charpin and Durand, "La prise du pouvoir par Zimri-Lim," M.A.R.I. 4 (1985) 298 n. 25.

2. *Three letters from princess Inib-sharri, wife of Ibal-Addu of Ashlakka*

n. ARM 10 78[23]

[5-14] I was very happy to hear the letter you sent me. May the goddess Belet-ekallim protect you in your post, but do please give favorable accounts of my messages before the king. Am I not living in another country? Why then is news of your well-being not constantly coming to me?[24]

[15-21] Well, regarding the brewer[25] about whom you wrote me; before the arrival of my letter and before your own (reached me), he himself had departed already and he came here on his own accord.[26] Be happy.

[22-27] Well, regarding the matter of Khaldu-muluk's household about whom you wrote me;[27] you should place them under your care:[28] This house is your house.

o. ARM 10 75

[4-16] About the report which I sent you, they are now bringing the bride-price to the king, my lord.[29] Do resolve (?) this matter, but stress my case. When the king charges you with preparing a document, please draft firm orders yourself on the tablet and send it to him. Moreover, as regards Itur-asdu, in the king's presence please set firm directives for him on my behalf.

[17-25] Another matter; about Libur-beli, Sammetar, and Khadnammur, they are bothering the king. As for you, do answer with the following, "Give back the woman's six pounds of silver and bring the messenger here . . . [*remaining words not clear*]"

p. ARM 10 79

[1-14] When Zakura-abum became ill, I wrote to my lord [the king]. When he died, however, I did not weep over him (the full) ten days (before) they made me leave the city, and I departed to Nakhur. I have conveyed a letter to my lord, so please bring it to his attention.

[15-30] About Libur-beli, the courier who belongs to the household of Yakhdullim, because I learned that this man belonged to the household of Yakhdullim, I paid cash to buy him. Now, however, this man is ignoring me in Zallukhan, [rest fragmentary, Inib-sharri wants Shunukhra-Khalu to bring the matter to the attention of the king.]

In a survey of Inib-sharri's letters, two observations may prove useful.

1. We know from MARI 2, 82 that Itur-Asdu left Mari for Nakhur around Zimri-Lim 5′. From the only dated text to mention Inib-sharri's name (ARM 7 125) we learn that by 12.ix.5′ she is already away from Mari (cf. also ARM 24 77). The letters cited here obviously deal with Inib-sharri after she had left Mari. I have placed ARM 10 78 chronologically the earliest, thinking

23. For collations of lines 15, 23, see Durand, "Le nom de l'Elam dans les archives de Mari," M.A.R.I. 3 (1984) 277-278.

24. (l.11-12) Inib-sharri is obviously posing a question (contra: Dossin).

25. (l. 15) I follow Durand's suggestion, that ^{lú}bappir may be the line's final signs.

26. The form at l. 19 must be an error for *ittalak* (rather than the impossible *imtalak*), von Soden, review of ARM(T) 10 in *Or*NS 48 (1980) 211.

27. (l. 23) Durand's collation removes from contention Oppenheim's suggestion that *ḫaltammatim*, "Elam," is at stake here. The PN Durand reads here, although attested in OB texts, needs explanation.

28. (l. 25-26). It is not clear whether the idiom, literally, "your hand ought to be set upon them," is one of protection or of authority, although the two notions are not mutually exclusive.

29. *terḫatum* in the nominative (line 5) is obviously an error here.

her to be in Ashlakka where she wrote it: Its tone does not betray the anxiety of other letters. However, it is possible that she wrote it after she sought refuge in Nakhur. Its message is one of polite (if not conventional) appeal, asking Shunukhra-Khalu, her "brother," to intercede in her behalf before the king. The reference to Khaldu-muluk cannot be properly assessed, as long as we have little information about the latter's presence in the Mari archives. What is curious here is Inib-sharri's insistence that Shunukhra-Khalu's influence apparently stretchs beyond Mari.

2. In the second letter, Inib-sharri's "king" may actually refer to her husband as well as her father.[30] We presume here that the bride-price, apparently about 6 pounds of silver, which Ibal-Addu had paid to Zimri-Lim upon his marriage to Inib-sharri, is being returned to Ashlakka. Inib-sharri is asking Shunukhra-Khalu to make sure that the divorce documentation is correctly framed when sent to Ibal-Addu. The second matter apparently returns to the first and Inib-sharri reminds Shunukhra-Khalu that other Mari officials are already arguing with the king (here: Ibal-Addu), and she wants him to make sure that Itur-asdu has instruction on how to receive her when she arrives in Nakhur.

Inib-sharri's third letter addresses the illness and death of Zakura-abum. Zakura-abum lived in Saggaratum (ARM 23 439:15) during the "Assyrian" period, but is found in Zallukhan during the reign of Zimri-Lim. The letter we have from him indicates that his activities occurred during the second half of Zimri-Lim's reign, and this ties in well with Inib-sharri's exodus to Nakhur.[31] The other matter brought out in her letter deals with her apparently unsuccessful attempt to secure the services of a purchased older servant.

C. CORRESPONDENCE WITH SUBORDINATES

1. *Letter from Yarim-Addu*

Yarim-Addu, Ambassador to Babylon (ARMT 16/1 226, No. 160), labels himself, "your son."

q. A.3441 (AEM 1: forthcoming)

[4-11] On a couple of occasions, my father has written when angry. From now on my father should not write me when angry; whatever my father requests of me [. . .], I shall fulfill my father's request.

[12-23] As to the [. . .], which my father does not have, [. . .] A cook which my father will be pleased to see, they have just bought in Babylon. I have not bought a brewer yet. I will acquire all of my father's need, as soon as Larsa is taken.

[22-23] My father should remember me with favor.

30. See ARM 10 84 where Inbatum uses *bēlum* to refer to her husband Khimdiya as well as to her father Zimri-Lim.

31. This letter is found in Jean, "Lettres de Mari IV, transcrites et traduites," *RA* 42 (1948) 70-72 (B.81):

> For the past three years, my district has not brought in a harvest because of the locusts and there is no old barley left. However, Western Yapturum has old barley and whereas we are not able to bring in a harvest, they are harvesting. Our men were constantly going to raid deep into Yapturum and into Zalmaqum territory. Upon observing that our men had gone to raid into Zalmaqum territory, the citizens of Yapturum became hostile to us. They have decided to enter the territory in order to bring back Ashkur-Addu [king of Karana] [*two lines unclear*] Now, they have captured our men who had gone [to raid] among them and have bound 30 men from my district. [A few lines damaged and difficult.]
>
> My lord ought to write Ibal-pi-El and have him depart to Shipakh, along with the Khanean of my district. He should place his hand over me (as protection).
>
> I am well; I am protecting Zallukhan-city for my lord. My lord should be pleased.

The mention of Ashkur-Addu of Karana allows us to place this letter after Zimri-Lim 9′.

The letter is purely personal, in that it contains no report of state mission, no request that something or another be communicated to the king. Yarim-Addu is prompted to write it to assuage Shunukhra-Khalu's anger (we do not know why), and he sent it sometime in late Zimri-Lim 10′ since Larsa fell in early Zimri-Lim 11′ when Zimri-Lim was aiding Hammurabi in defeating Larsa. We learn here that Shunukhra-Khalu's household was large enough to need its own cook and brewer.

D. CORRESPONDENCE WITH PALACE OFFICIALS, POSSIBLY SUBORDINATES

I have placed here the correspondence with officials who label their relationship with Shunukhra-Khalu neither with *wardum* nor *ra'īmum*. The tone of their missives, however, is that of persons eager to obtain Shunukhra-Khalu's good-will.

1. *Letter from Bakhdi-Lim, the palace attendant*

r. ARM 6 55

[4-9] Manatan has promptly sent me artisans and men who cannot go on a campaign; but he did not send me men capable of travelling.

Now therefore I have sent a letter to the king; please bring this message to the king's attention so that they can register all the men that the king assigns him and send me men capable of travelling. They ought also take their provisions (with them).

This letter is a variation on the standard communication administrators dispatch when they have superiors as well as subordinates with whom to contend. Bakhdi-Lim is merely alerting Shunukhra-Khalu to the fact that he has not been fully served by Manatan who was, no doubt, following his own set of orders. In this way, if anything goes wrong with the project at hand, Bakhdi-Lim can offer an acceptable reason. While the king and Shunukhra-Khalu were apparently not in town, Manatan (about whom see above, sub Beltum) probably was operating within the Mari palace.[32] It is therefore curious to note how bureaucrats avoided direct confrontation when their competence was at stake, choosing to place the onus on a peer by writing to a superior rather than by dealing directly with him.

2. *Letters from Yasim-sumu, the šandabakkum*

The correspondence of Yasim-sumu is well-known, thanks to the dossier collected mostly in ARMT 13 and the study which Birot consecrated to him in 1964. The documents collected here reveal Yasim-sumu, who never labels his correspondent with the collegial *ra'īmum*, to be a very eager bureaucrat constantly trying to gain the king's attention by writing Shunukhra-Khalu. This is clear from the following letter, albeit not fully preserved:

32. Yasim-sumu and Manatan jointly send ARM 13 26 to the king, confirming that the latter worked in the palace, at least for part of his career. However, it is worth noting that the body of the letter has a single voice only:

> The city of Mari, the temples, the palace and workshops are in good order.
>
> Two palace slaves have escaped the queen's quarters towards the Itur-Mer gate and [. . .] of the middle . . . . Immediately, Yar'ip-Dagan notified me. I was about to catch (them), but they slipped down the wall, where there are holes. But I called upon a gardener from outside (the rampart), and they were seized.

ARM 23 237 also places the two in the same document, albeit Manatan (perhaps a homonym) is located in Terqa.

s. ARM 13 52

I am now sending a letter to the king regarding the storehouse for barley storage . . . . When/since you strove [33]to [. . .]. You will do me a favor by the way you assign work on my behalf.[34] Kibri-[Dagan?] ought to give orders in your presence. Additionally, do send a message in response to my letter.

t. ARM 13 49

I am presently sending a letter to the king regarding Yamraṣ-El's journeying (to/through Mari). Please have the king listen to the letter and send me an answer.

This letter is also of a type that is common to Mari palace bureaucrats. Yamraṣ-El is a potentate in the Upper district who probably owes his seat of power to Zimri-Lim.[35] Such leaders found it necessary to show their fealty by occasional visits, and this required passage through Mari in order to join the king when not in the capital. ARM 24 75, unfortunately lacking a year-name, records the outlay of wine "when Zukhatni [a Mari diplomat], Yamraṣ-El, and notables were seated before the king."

u. ARM 13 50

I am now sending a letter to the king, please make the king aware of this letter's contents so that he can give me enough to do.[36] At the same time, I am sending a letter to Bakhdi-Lim. Strive[37] to send me a thousand men.

Until its last phrase, this letter has little to say of practical value. Yasim-sumu demonstrates his attachment to duty by telling Shunukhra-Khalu of his plans to contact to Bakhdi-Lim. By doing so, however, he succeeds in shifting future responsibility to Bakhdi-Lim. We gain the same impression from reading the next letter. Here, however, the accent is on Yasim-sumu's extraordinary efficiency.

v. ARM 13 51

[4-14] In Terqa, I have taken charge of supplies and I am heading toward Saggaratum. In one day, I shall manage Saggaratum's palace, and the day after, Dur-Yakhdullim's.
[15-17] If the king is delayed there (i.e., where he is), I want to go to Terqa ahead of him. Otherwise, if the king [plans to come here], I want to wait in Saggaratum itself for an expert.
[18-22] Whatever the response, an answer to my letter should be reaching me. I am also writing to Khabdu-malik.

The next series of letters find Yasim-sumu involved in the designation of a year-formula, which is now known to us as Zimri-Lim 10′.

33. A meaning for preterit *tuštēpiš* is difficult to pin down; *AHw*, p. 228b suggests "etwa betätigen, aktiv werden." The Mari contexts suggest differing translations when the Št-stem of *epēšum* occurs: ARM 2 77:9 (for which see *CAD*'s different renderings in M/1, p. 189 ["to be fitting"]; S, 34 (4) ["to have a matter conducted"]); 2 23:7′ (*CAD* E, p. 234 [5c2′], "suggest").

34. This rendering is tentative for *kīma ša ana ramāniya tušeppešu tudammaqa*[*m*. . .].

35. If Yamraṣ-El and Yamruṣ-El are names of the same person, we may be dealing with the king of Qa. In ARM 9 241, he presents the palace with honey. For reasons that are not obvious to me, Charpin and Durand, M.A.R.I. (1985) 4 295 n. 14, would date this particular document to "the end of Zimri-Lim's reign, after the Ashlakka war [i.e. after Zimri-Lim 12′]."

36. Literally, ". . . and let him act so that my time does not remain empty."

37. See note 22.

w. ARM 13 47[38]

Yasim-sumu to Shunukhra-Khalu

[w′. ARM 13 48—I am now sending to the king a letter about the *igum*-reservoir and another one about the wooden *gurummarum*-product. Have him listen (to them and send me a response.]

[4-6] About naming the year, you wrote me the following,
"Year: 'Zimri-Lim dedicated a large throne to the god Dagan.'"
[7-14] This throne, however, has not been dedicated yet. I am therefore sending now to the king a letter, "the name of the year is: 'Zimri-Lim went to Babylon's rescue; (marking) a second time against Larsa.'"
[15-19] Draw the king's attention to this message, and write me whatever the decision about it. Send me also news about Atamrum (of Andariq).

ARM 13 27

Yasim-sumu to the King

[4-10] Regarding the *igum*-reservoir about which my lord wrote me, in accordance with my lord's message, the reservoir is now smeared with crude bitumen from the base up to the top portion. Toward the top, it is smeared with refined bitumen, above which they plan to plaster it with clayish mud.

[11-16] Another matter; they ought to call in this way the year that is coming: "Year: 'Zimri-Lim went to Babylon's rescue; (marking) the very second time against Larsa'."

In order to appreciate the tenor of this dossier, we should reconstruct the following steps:
1. The king writes a letter to Yasim-sumu, seeking information about work on the reservoir, and on some wooden product.
2. About the same time, Shunukhra-Khalu sends a letter to Yasim-Sumu giving him a formula by which to name the incoming year. It is important to recognize this, since despite Birot's early recognition of this condition,[39] the literature on the subject often gives Yasim-sumu the privilege of taking this step. I do not doubt that the initiator of the formula was either the king himself or his trusted advisor, Shunukhra-Khalu.
3. Yasim-sumu dictates an answer for the king on the matter of the reservoir (ARM 13 27) and, very likely, a lost letter on the wooden product. The two topics could be addressed separately since work on the wooden product probably did not require the effort necessary for the reservoir job.[40]

Yasim-sumu gingerly broaches the topic of the year-name. He offers no excuses since it will reflect harshly on his own competence. He relies on a letter (w) which he is about to send to Shunukhra-Khalu to carry a reason for his failure. We do note that the version of the year-name Yasim-sumu proposes to the king differs slightly from what he sends Shunukhra-Khalu: The former emphasizes "the second year," as if to curry favor from a king who no doubt appreciates this recall on the part of a subordinate.

38. Translation in Oppenheim, *Letters from Babylonia* (Chicago, 1967), pp. 104-05 (no. 45).

39. Birot, *Syria* 41 (1964) 57-63.

40. Smearing a reservoir with bitumen, then plastering its top with clay (the precise order is not clear to me). On the *igum*, which seems to be a reservoir, see ARM 10 25.

4. Yasim-sumu's response (w) to Shunukhra-Khalu's lost letter has only apologies: the throne of Dagan is not ready, and therefore has yet to be dedicated.[41] Yasim-sumu gives no excuses for this failure to get the job done, but turns immediately to a face-saving solution: he suggests that the year be named after Zimri-Lim's campaign against Larsa in behalf of Babylon. In doing so, however, Yasim-sumu betrays his ignorance of the convention Zimri-Lim's chancellery follows in formulating year-names: a tendency not to concatenate two separate events into one year-name.[42] Yasim-sumu hurriedly turns to another topic (note absence of *šanītam*) that, he hopes, is likely to require more attention. It is not surprising, therefore, that Yasim-Sumu's suggestion fell on deaf ears and his formulation as given in ARM 13 47 and 27 has yet to be found in actual documents.

5. As he dispatches ARM 13 27 and (w), Yasim-sumu also sends (w'), with information about the reservoir and the wooden product.

3. *Letters from Khabdu-malik*

Khabdu-malik does not use any greeting form when addressing Shunukhra-Khalu; but this is not unusual.[43] He is well-known as a merchant-diplomat and whether he is related to Iddiyatum by blood, or is merely under his tutelage, is raised by the lively letter he wrote Iddiyatum (ARM 13 101).[44] It is quite probable that the many persons named "(Ḫ)abdu-Malik" as cautiously dispersed by Birot over a dozen personality ought to be collapsed into a handful, with the following assigned to our Khabdi-malik: the diplomat, the high functionary, the sukkal, the Mari high functionary, and possibly also the provincial high functionary.[45]

x. A.2081=A.4214 (=AEM 1:forthcoming)

[4-5] I am well. I have dictated now a full report in a letter which I have sent to my lord. As for me, after the despatch of this letter of mine, I should depart from here within 5 days. Write me of your well-being.

[16-21] Another matter; since I sealed the letter for the king, news came that the Turukku army has just crossed (the river). Announce (it) to the king.

This letter gives us an insight about the way information reaches the king. Khabdu-malik had written a letter to the king, reporting on his mission. He then writes to Shunukhra-Khalu to inform him of this act, probably so that the latter will be at the *qui-vive* when it arrives. Khabdu-malik reveals his travel plans and ends formulaically by requesting news of his correspondent's well-being.

41. This piece of information allows us to speculate that the dedication of cultic paraphernalia does not require the king's presence.

42. See Sasson, "'Year: Zimri-Lim Dedicated his Statue to the God Addu of Halab': Locating a Year in the Reign of Zimri-Lim," M.A.R.I. 5 (1986) 577-589.

43. Charpin writes me, "Remarquer aussi l'étiquette: certains s'adressent à Š. en an tant que *râ'imka*, d'autres en tant que *mâruka*; mais le sukkal Habdu-Malik (qui semble avoir peu apprécié Šunuhra-halû) fait sentir sa supériorité en n'employant aucune formule." Actually, neither Yasim-sumu nor Bakhdi-Lim, who to my mind are likely Shunukhra-Khalu's subordinates, uses such a formula.

44. See the important treatment by Durand, "Relectures d'ARMT XIII, II: La Correspondance de Numušda-naḫrârî," M.A.R.I. 2 (1983) 155-156. For a profile on Khabdu-malik see Pack, *Administrative Structure*, pp. 465-467.

45. See ARMT 16/1, p. 95 Nos 3-6, 9. In ARM 7 220 (no date; collated by Charpin and Durand, "Relectures d'ARMT VII," M.A.R.I. 2 [1983] 91-2) Khabdu-malik is placed in the following roster, a veritable Who's Who for Mari's officialdom: Inib-shunu/ Kanika-El/ Asqudum/ Yasim-sumu/ Khabdu-Malik/ Iddiyatum/ Yasim-Dagan/ Bakhdi-Lim/ Yasim-El/ Belshunu/ Warad-ilishu/ Darish-libur . . . , etc. According to ARM 7 120:16'-31', five persons are listed to be assigned (to other quarters) "when (inspectors) audited the household (palace?) in the presence of Yasim-sumu, Khabdu-malik, Mukannishum, and Bunuma-addu."

Before the tablet is placed in its envelope; indeed before it became too dry to accept new information, urgent news comes to Khabdu-malik about the Turukkus, and he adds it as a *post scriptum*.[46] That Khabdu-malik did not feel it necessary to write another letter to the king is rather surprising. However, this is clarified by the next letter which deals with how communication is carried among the king, Shunukhra-Khalu and their correspondents.

y. ARM 2 132[47]

[5-9] Concerning the report in a letter to the king, it is you alone who has been reading it —no other person should be reading it; I have therefore not sent you a copy of the king's letter.[48]

[10-17] Now, therefore, I have for the *second time*[49] sent a letter, to the king and to you; I am repeating the previous report.[50] Listen to this letter, and if it is appropriate, have the king listen to it.

The precise import of this letter depends on how one translates *meḫrum* of line 8. Oppenheim renders "response, answer," and reconstructs a situation in which Khabdu-malik is pointedly berating Shunukhra-Khalu for intercepting his letters destined to the king even when these are responses to a royal request. Nevertheless, according to Oppenheim, Khabdu-malik is also accepting Shunukhra-Khalu's interference, albeit he is sending copies of the same letters to the king.

Oppenheim is aware of difficulties in his interpretation, and I suggest that Khabdu-malik was probably reacting to the loss of a previously sent letter. Khabdu-malik ought to have sent a copy to Shunukhra-Khalu, and through this copy the king would have gotten the message. Khabdu-malik therefore defends himself by stating that since Shunukhra-Khalu is the one who reads the king's correspondence, he did not think it necessary to have sent another one. He will henceforth do so.

ARM 2 132 makes it clear why Khabdu-malik did not feel it necessary to send a separate letter to the king with the information he added as a P.S. to A.2081: Khabdu-malik simply assumed that a letter sent to either is a letter sent to both.

z. A.455(=AEM 1:forthcoming)

[4-11] Ever since I departed, I have been travelling. Constantly seeking news of Atamrum, (I heard), "He is in Shubat-Enlil," and "Not true! He has left Shubat-Enlil for Andariq," and "[. . .]."

[12-18] I tarried at the crest of Yabniya,[51] but I have sent (men) to Shubat-Enlil and Andariq to locate where he is, telling them, "Find out and bring me information; I want to leave."

46. The information may be related to the letter quoted by Birot, "Nouvelles découvertes épigraphiques au palais de Mari (Salle 115)." *Syria* 50 (1973) 6.

47. Translation and treatment in Oppenheim, AS 16, p. 353.

48. Line 8: In connection with *ṭuppum*, "tablet, letter, message," the noun *meḫrum* can have two meanings: "copy (of a letter)," as well as "answer (to a letter)." In this letter, the choice can be crucial.

49. A mistake for *ša-ni-em*? (cf. ARM 13 48:5).

50. Translation of this passage depends on how to assess (*ṭēmam*) *maḫrêmma*. *CAD* M/1, p. 114 (2a2') has treated it as an adverb, suggesting something like: "I will send a report promptly," a rendering that does not suit the context. Finet, ARMT 15, p. 220, has, "c'est un avis très important que j'écris." (Cf., *AHw*, p. 586b). It may, however, merely be an adjective referring attributively to a sequence of letters and I render it accordingly (see ARM 10 118:9 and Oppenheim's translation).

51. Perhaps the same place as Yabliya, if so read *ya-ab-li-ya*. Charpin states, however, that a Yabniya is cited in A.7166.

[19-29] I have been delayed in my departing because I wrote to the *merḫum*-official, to lay before him what my lord has charged me regarding the matter of Shubat-Enlil. I fear that the king will hear how I have tarried a full day in Qattunan; I have therefore sent a letter to the king. Please bring to his attention the information which I sent you.

The Khabdu-Malik correspondence, which Charpin will publish in AEM, will find him heavily involved in matters regarding Andariq and its king Atamrum. This Atamrum, who gave Zimri-Lim much trouble, reigned at Andariq from Zimri-Lim 8′ probably through Zimri-Lim 11′.[52] A. 739 (AEM 1:forthcoming), of which I know only the early lines, has Khabdu-malik vainly trying to console Atamrum for the loss of (his wife?) Khashtutu. Khabdu-malik apparently goes on to speak about Shunukhra-Khalu being sent on a mission to Atamrum. If so, then we learn from it that Shunukhra-Khalu does indeed leave the king's presence on particular missions.

E. CORRESPONDENCE WITH COLLEAGUES

In this category are placed letters in which writers call themselves *ra'īmum*.

1. *Letter from Ibal-pi-El*

aa. A. 158[53]

[5-9] You know well how our lord has admonished[54] us a couple of times in our meetings, "Why is it that confidential information takes to the wind as soon as I tell all of you?" This is how our lord admonished us.

[10-20] I am now troubled by these words and I will not allow any of my lord's servants to hear the letters which come to me. In fact, I have just recently written to my lord about this resolve saying, "My lord ought to record on a document and send to me a list of the men I can allow the hearing of my lord's letters; I want to do what my lord instructs me."

[21-29] This is what I wrote to my lord, but my lord has not written me any response to this suggestion. Now I fear that I may allow the hearing of my lord's message to somebody and the information will take to the wind, leading to troubles for me.[55]

On the other hand, if I do not allow my lord's servants to hear (it), but something happens, my lord will say, "Why did you not allow my servants to hear (my message), and consequently have not deliberated over the information which I sent you?"

[30-36] I am troubled by both these possibilities. Now therefore, if it *suits you*,[56] bring the matter to my lord's attention, record on a document and send me a list of the men who may listen to my lord's letters. In this way, may I find confirmation that you are a colleague and friend.

Ibal-pi-El addresses Shunukhra-Khalu as "your friend," *ra'īmka*. Two letters between the same correspondents were cited long ago by Jean.[57] This letter may be one of them, and it is

52. Birot, "Données nouvelles sur la chronologie du règne de Zimri-Lim," *Syria* 55 (1978) 342, 343 n. 2.

53. Dossin, *Akkadica* 25 (1981) 2.

54. *sunnuq um* with accusative seems here to mean "admonish" rather than the more usual "interrogate, question."

55. Or: "Now, I fear that someone may allow the hearing of my lord's message and . . ."

56. Copy has *ki-na*-PI-*ka-ma*, which Dossin relates to *kinattu*, "person of equal rank": but *ina* would be odd. The adverbial phrase *ina kīnātim* is well-known to Mari (cf. *CAD* K, p. 384 [c]), but in this case the pronominal suffix would be odd. Still, one would expect something like "correct behavior," which in ARM 2 132:16 is expressed by *šumma rittum*.

57. Jean, "Excerpta de la correspondance de Mari," *RÉS* (1938) 130. [See now *RA* 130 (1987) 131 n. 21]

exceptionally revealing of the working of government bureaucracy and the role that Shunukhra-Khalu plays within it.

Ibal-pi-El, an official who held a diplomatic as well as a military portfolio, is troubled about the lack of circumspection among top bureaucrats.[58] More so, however, he is distressed by his king's thinly veiled charge about leaks within Ibal-pi-El's staff. He had thought that if the king would list those who are permitted the passing of information, this will solve his problem. He made a proposal to the king who, by not replying, may be showing his displeasure with it. It has dawned on Ibal-pi-El that the king may not favor the suggested restriction, for the fewer the officials to receive instructions, the less likelihood that a task will get done. Ibal-pi-El, however, cannot afford to remain without instruction. He therefore turns to Shunukhra-Khalu and shares with him his thinking on the matter, for he does not doubt that the king is more likely to react positively to his reasoning when uttered by the trusted Shunukhra-Khalu.

2. *Letters from Yamṣium/Yamṣûm*

Yamṣium labels himself "your friend," in A.2901 and A.4212. He was an itinerant merchant-diplomat, representing Mari at Ilanṣura[59] and Karana. His mention of Ashkur-Addu as king of Karana allows us to place his letters around Zimri-Lim 10′-12′ (capitalization designates new material).[60]

bb. A.2901 (=AEM 1:forthcoming)
Yamṣium to Shunukhra-Khalu

[4-5] I am well. Karana city and (its king) Ashkur-Addu are well.

[6-15] About the sheep and their herdsman, belonging to Ṣuratan, which the Turukku-tribesmen have carried off, a messenger of Ashkur-Addu together with Ṣuratan went to Zaziya, and he answered them, "I have carried the sheep off to his district; [. . . .] I will carry them off."

[16-18] Another matter; you had told me the following, "Send me (any) good quality leather footwear which you find."

A.460 (=AEM 1:forthcoming)
Yamṣium to the king

[5-7] I am well. THE MEN UNDER MY COMMAND ARE WELL. Karana city and (its king) Ashkur-Addu are well.

[8-14] ANOTHER MATTER; about the sheep and their shepherd, belonging to Ṣuratan, which the Turukku-tribesmen have carried off, ONE messenger of Ashkur-Addu together with Ṣuratan went to Zaziya, KING OF THE TURUKKU, and he answered them, "[I have carried off the sheep] into his district. . ."
[remainder of text broken]

58. This topic is also the subject of ARM 2 124, a letter which Yamṣium (on whom, see below) sent the king and which is as full of translated native colloquialisms as we are likely to get (Veenhof, *RA* 76 (1982) 119-24):

> Kunnam does not know that Ibni-Addu is on good terms with me. When drunk, he is wont to talk, saying, "Don't you know that Zimri-Lim's words are available to the *šukkallum*?"
> "How?" I asked.
> "The Khanean who waits on Zimri-Lim betrays to them Ishar-Lim; Moreover, there are those among the Sutu-tribesmen who constantly write Ishar-Lim," he said.
> Now then, my lord should investigate these matters so that those who are betraying my lord's statement, my lord should question them! Kunnam does not ever tell lies; he keeps the secret of his lord; he never tells lies.
> I fear that Ishar-Lim is doing like Atamrum
> [remaining lines damaged].

59. Durand, "Trois études sur Mari," *M.A.R.I.* 3 (1984) 168.

60. Birot, *Syria* 55 (1978) 343. D. Charpin kindly tells me that Ashkur-Addu's presence in the Kakhat region is attested from Zimri-Lim 6′.

[19-20] I will inspect the leather footwear and [. . .[61]].
[21-29] If your messenger has truly just now departed, send me [a mold for] your feet, and I will [locate] quality leather footwear. Also, write me about whatever you need. Do return quickly to me the bearer of my letters, for he ought not be detained.

It is obvious that these two letters carry the same political information, that they were sent at about the same time, and that, according to the ending of text (bb.), the same messenger transported them. We do not know whether Yamṣium had more to say to the king, but we do note variations in the matched segments:
1. Writing to the king, Yamṣium has an expanded greeting wherein he reports on the well-being of the men (military or otherwise) under his control. In this way, he assures the king of his competence as he turns to the report at hand.
2. The letter Yamṣium sends to the king strives for greater precision, in language and information. Yamṣium uses *šanītam* to separate his greeting from the main body of the letter; he inserts the integer "1" when speaking about Ashkur-Addu's messenger; he makes sure to label Zaziya "king of the Turukku." Moreover, two discrepancies suggest that Yamṣium used different scribes: when referring to the delegation to Zaziya, *illikū* is construed with *ana ṣēr*, rather than simply with *ana* and "Turukku" is written in a fuller manner (*tu-ru-uk-ku-ú* ki) when writing to Shunukhra-Khalu than when writing the king (*tu-ru-ku-ú/tu-ru-ki-im* ki).

Yamṣium's letter to Shunukhra-Khalu moves to an item of personal interest, his search for footwear that would please Shunukhra-Khalu. This particular section is not atypical of the relationship between personalities of somewhat equal rank, in its vocabulary which restates the request, which purchases more time by which to fulfill it (he needs the shoe size), and which offers assurances of his readiness to demonstrate his friendship. The next letter offers variation on this theme.

cc. A.2281=A.4212 (=AEM 1:forthcoming)

[5-11] You wrote me about an ox for your sacrifice. After writing this letter of mine, I will donate an ox. The ox which I will donate for you is yours as a gift. May it be you who is my supporter at the palace gate.
[13-21] Moreover, send promptly to me my messenger, who is to take letters to my lord. You should not detain him [3 more damaged lines].

What is striking about this brief note of Yamṣium is its language, very much unlike the inelegant Akkadian of ARM 2 124[62] or the pretty standard concoctions of small-time Mari diplomats (the two letters just cited).[63] Here, it is fairly unusual, if not sophisticated: *šurrukum* is not yet known to *AHw*, and in an y case the G, *šarākum* is applied to an exchange among human beings, mostly when it goes from superior to inferior. Therefore, despite my rendering above (Charpin uses "offrir" to translate), I am not sure what Yamṣium is implying by the verbal form.

61. I do not understand the form in l. 20. Lines 19-20 read: (ku₆)šuḫub₂ *anaṭṭalma/ ra-aḫ-ḫi-ri-tum-ma.*
62. See note 58.
63. Charpin, however, writes me about the "badly written signs in the Yamṣium dossier."

mukil kutalliya is also unusual to the context and its referrent is not clear. Charpin renders the section, "Le boeuf que je t'offrirai, c'est ton cadeau. Puisse-t-il protéger ma situation," and begins another section with, "Tu es à la porte du palais: renvoie-moi rapidement mon messenger par qui je fais porter des tablettes à mon seigneur."[64] My own translation presumes that the expression is likely to have a human being rather than an offering in mind. I am also thinking that to speak of Shunukhra-Khalu at the palace gate is better suited to imagery about an intercessor than to a realistic declaration. [But see now Durand, cited in n. 81, pp. 42-49.]

3. *Letters from Yaqqim-Addu, governor of Saggaratum Province*

In writing to Shunukhra-Khalu, Yaqqim-Addu labels himself a *ra'īmum*. The letter we present first is not particularly illuminating about their relationship.

dd. ARM 14 36

[5-12a] At the time I am sending you this tablet of mine, the donkeys of the messenger from Yamkhad have reached Dur-Yakhdullim. [The donkeys] will receive their provisions tomorrow.
[12b-15] Advise the king that as long as the messenger had not arrived here, I had not written him. However, I have written Khabdu-malik about this announcement.
[16-21] Another matter. They have gathered for me 30 truffles. I have supplied the king (already). As for you, I am sending 9 truffles as your share. Too little; but I could not add more.

The brunt of this letter is common to many others from Mari: Announcing the arrival of foreign missions and a request that this fact be brought to the king's attention. The last paragraph turns personal and is meant to accompany the despatch of a gift. The passage, incidentally, shows that even when travelling with the king, Shunukhra-Khalu had his own household where his food is being prepared. He did not eat from the king's table.

We have other testimony from Mari that the truffle was a much appreciated delicacy.[65] When writing to the king Yaqim-Addu could devote entire letters to the topic. However, the statement to Shunukhra-Khalu about truffles is merely a way in which Yaqqim-Addu can alert him to how highly he is appreciated. True, the king receives more of them; but this is as should be expected. What is not, however, is the last remark which assures Shunukhra-Khalu that only realism prevented Yaqqim-Addu from going beyond this quota.

The next letter is a report regarding two separate topics which Yaqqim-Addu needs to have clarified. When the king makes a request from his governor (probably for betyls[66]), and the latter finds himself unable to fulfill it because of shortage in equipment, material, or personnel, Yaqqim-Addu normally writes an explanation and applies for help. When there is the fear that the king may not pay sufficient attention to his governor's predicament, Yaqqim-Addu finds it necessary to have his case argued by Shunukhra-Khalu. The translation below picks up on the second topic:

64. Here is the Akkadian of A.2281:5-17: *aššum* gu₄ *ša ana* siskur₂-re-*ka/ tašpuram warki ṭuppiya annīm/* gu₄ *ušarrak/* gu₄ *ša ušarrakkum/ qīštaka/ lū mukil kutalliya/ ina* ká *ekallim atta/* [1/*ú*] dumu *šipriya/* [*ša*] *ṭuppātim ana šēr bēliya/ ušaballam/ arḫiš ṭurdamma/ la takallaššu* . . . .
65. Yaqqim-Addu writes two letters to the king regarding his despatch of truffles. ARM 2 104, which was probably written during Zimri-Lim 4′ (see ARMT 23, pp. 17-21) and ARM 14 35. In ARM 3 28 Kibri-Dagan sends Zimri-Lim a few baskets of truffles gathered in his district (Terqa). Yasmakh-Adad had some purchased from Ganibatum (Birot, *Syria* 50 [1973] 3).
Stol, Review of Birot, ARMT 14, *BiOr* 35 (1978) 220 gives a nice bibliography on harvesting truffles.
66. *NABU* (1987) 77-78.

ee. ARM 14 29.

[20-43] The king once wrote me about (a supply of) large boulders, and I sent him the following reply:

> My lord wrote me about looking for large boulders in the *lasqim* region. There are 20 workers in the Mari province, 27 haulers in Terqa and [x+]6 haulers in my district. My lord ought to dispatch Lakhwi-Bakhlu together with bronze *tools*, so that the stones *can be cut*.

[30-43] This is what I wrote the king, but he did not return an answer to me . . . . He should respond to me one way or another. I fear that the king will say, "I have written you about the stones, why *did you not send the stones*?"

[40-43] I did not write to the king because he did not return an answer to my letter.

Among the more interesting letters in Yaqqim-Addu's dossier are the letters he writes to the king and to Shunukhra-Khalu about the same topic.

ARM 14 10

Yaqqim-Addu to the King

I had asked my lord about my trip to Qattunan and he told me:
"I shall be going myself; come along with me."

I reached Saggaratum now (to find that) two servant-women were dying in the household. I looked into the matter and (heard) the following: "It is because of the sacrifice due Amu-Tikhran[67]."

If it suits my lord, I want to go and satisfy this god. The round trip should take only five days; I will certainly not tarry there long! During this sacrifice, I plan to pray for my lord.[68]

ff. ARM 14 11

Yaqqim-Addu to Shunukhra-Khalu

When my lord sent me (on errand) to the Khanean-tribesmen, I left behind some flour and sheep for the sacrifice in Qattunan to the god Amu-Tikhran —this sacrifice has constantly been on my mind.

Now when I departed from Mari, a [lion] killed a young servant of mine. I arrived at Saggaratum (to find that) two servant-women were dying and my whole household was anxious. I looked into the matter and (heard) the following: "It is Amu-Tikhran, because of his sacrifice."

[3 lines damaged . . .[69]] bring the matter to my lord's attention, so that I may go, offer this sacrifice and pray for my lord.

Worth noticing here is the way Yaqqim-Addu repackages the information to suit two different audiences: the king and a colleague. He is much more honest about what troubles him when he addresses the latter: He had been somewhat lax about fulfilling the sacifices due to the god, and although he had it on his mind all the time, he simply had to drop everything to attend to other matters. The reference to his errand with the Khaneans is meant to convey that his calendar was very full during those days.

But the signs of the god's anger were manifest, one of his servants was killed by a lion and two of his household personnel were dying under circumstances which had everyone (perhaps it is Yaqqim-Addu's conscience that is speaking[70]) recalling Yaqqim-Addu's neglect. He wants

67. That is, the manifestation of the god Amu which is attached to the village of Tikhran.

68. The last two sentences are taken differently by Stol, *BiOr* 35 (1978) 219: "But should I not tarry there a while in order for me to pray for my lord during this sacrifice?"

69. Qattunan, where the god resides, is mentioned in the break.

70. Indeed, this is how Birot understand the passage: "Having looked into the matter, I thought: "(It is) because of the sacrifice (to offer) Amu-of Tikhran."

Shunukhra-Khalu to interfere in his behalf, explaining to the king the circumstances for refusing to join the king's caravan.

When writing the king, however, Yaqqim-Addu opens by acknowledging the order he had received. He says nothing about his own neglect of duty on his previous assignment; instead, he gives evidence of obsequious solicitation of the king's desire. Note here how Yaqqim-Addu couches the king's order in an imperative tone. Jumping straight to the manifestation of divine anger, Yaqqim-Addu broaches why he needs to go to Qattunan. Here, however, he treads gingerly, and asks for no more than 5 days. To make sure that his lord does not get annoyed by this obvious neglect of a royal order, he assures him that he plans to include special prayers on his lord's behalf.

More complex as evidence of Yaqqim-Addu's state of mind are the following letters:

gg. ARM 14 6

Yaqqim-Addu to Shunukhra-Khalu

[5-7] Now, I have written the king regarding MY bull destined for an *igisûm* offering, which has become sick from its bulk.

[8-?] ASIDE FROM THIS QUALITY BULL, THERE IS NO OTHER DECENT BULL. EVER SINCE I AM TO BE FEEDING BULLS FOR THE CULTIC OFFERING, NEVER, ASIDE FROM THIS BULL [break].

[16-28] NOW IF YOU ARE TRULY MY FRIEND, [. . .], a royal letter should come to me so that I could despatch this bull by loading him on a boat. However, because I fear that this bull may become ill in mid-voyage *and its meat may lose its value*, a cook should be sent to me TO RIDE THE BOAT WITH THE BULL. *In this way, God forbid, when the bull becomes ill*, they will twist back its neck and assign its meat to the palace.

[29-32] IN THIS WAY, MAY I EXPERIENCE YOUR FRIENDSHIP. AS SOON AS YOU HEAR THIS LETTER OF MINE, SEND ME IMMEDIATELY A RESPONSE TO IT.

ARM 14 5

Yaqqim-Addu to the King

[5-9] A FATTENED, QUALITY bull destined for an *igisûm* offering, was becoming sickly fat and IS REFUSING TO FEED. *Now then, I fear that this bull will collapse, and its meat will lose its value.*

[10-19] My lord should give me permission to despatch this bull by loading on a boat. However, because I fear that this bull may become ill in mid-voyage, my lord ought to send me a cook, so that they could twist back THIS bull's neck, and assign its meat to the palace.

[20-25] I WORRY LEST MY LORD SAY, "THIS BULL IS A [. . .]." THEREFORE, I HAVE HAD THE [. . .] BROUGHT UP [. . .] WITH ME AND HAVE SENT TO MY LORD AN *EXPLANATION* ON HIM.

Yaqqim-Addu's exchanges with the king and with Shunukhra-Khalu allow us to gauge the subtle changes in tone that officials assume when dealing with an embarrassing situation. As background, we quote a letter the king received from one of his early appointments as governors at Qattunan (ARM 2 82:28-38). Zakira-Khammu is fretting about provisioning for the visit of Hammurabi, king of Kurda:

> If a bull . . . is to be slaughtered, there is one bull, intended as *igisûm* for the palace, who is full of meat and is so fat that, upon standing, the blood catches toward the bottom around his legs, making it impossible for him to stand. When he needs to feed, they must constantly

prop him on his stall.[71] This bull will certainly not be able to go to Mari. My lord ought to write me whatever his decision about the matter of this bull.

Zakira-Khammu's letter offers testimony for the fact that animals which the palace receives as *igisûm* are parcelled out to be raised at various communities.[72] It also makes it clear that unless specific permission is obtained from the central administration, such animals are not to be slaughtered where they are raised, but are to be sent to Mari itself. In Zakura-Khammu's case, an impending visit by an ally gives him the opportunity not only to get rid an unhealthy bull, but also to dispense with arranging for its voyage to Mari.

I do not know why bulls under such circumstances have a tendency to grow beyond normal expectations.[73] Whatever the reason for the condition he now faces, Yaqqim-Addu is now forced to get the bull out of Saggaratum, lest it die under his own management. The letter to the king (ARM 14:5) is first to be composed and we follow its sections:

a. The *opening statement* (lines 5-7) is very much matter of fact: A quality bull (provenience not stated) is bloated beyond recovery.

b. Yaqqim-Addu poses the *problem as a hypothesis* (8b-9): The bull might well die before it can reach Mari for slaughter.

c. The *request* is twofold: 1. Permission (10-13) to transport the bull by boat and 2. Desire to obtain (14b-19) a cook who will slaughter the animal on board.

d. It is only then that Yaqqim-Addu begins his *excuse* (20-25), which unfortunately is not clear to me. Whatever were its contents, however, the excuse is clearly too brief to convey much information, and Yaqqim-Addu ends in a resolute fashion, emphasizing that he has written an explanation about the whole matter. The king may well decide that the letter being read to him is that report itself and may well be satisfied with Yaqqim-Addu's clear exposition of the matter.

Yaqqim-Addu's "explanation" is contained in his letter to Shunukhra-Khalu (gg.). Here the sections it shares with the letter sent to the king are reorganized while new material is added:

a. *opening statement* (lines 5-7) is apologetic from the outset: Yaqqim-Addu tells that this bull under his care actually formed part of his own presentation to the palace. The suppression of this piece of information is noteworthy, for had the king received it, he might well have questioned the quality of the Yaqqim-Addu's ox.

71. For *ana ukullêšu ina dunnišu uštanatbūšu*, see *AHw*, pp. 177, 1343b.

72. On *igisûm*, a gift given to the palace apparently on an involuntary basis, we have a number of references in the Mari archives. The administrative tablets speak of animals thus presented which are nu.sig$_5$.ga ("unacceptable," but why or how?), ARM 23 223 (see above sub B.1, Letter from Beltum); The colophon to ARM 7 217 mentions the "silver of collectors of rent and *igisêm* (deposited) in the *bīt mayyāli*, in the king's presence." ARM 9 24 iv 55 refers to rations given for feeding *igisê* bulls.

The letters speak of a *bīt igisêm* (ARM 9 72:12) as an appropriate place to catch the king's attention. A chance remark by Yaqqim-Addu to the king is about his eagerness and capability, "Since the governor who preceded me held this field, now [. . .] I will lead to my lord, one *igisûm* after another. (ARM 14 81:41-44)" Two other letters speak about the quality of a bull appropriate as *igisûm*. The first, ARM 1 86, Shamshi-Adad sent to his son in Mari:

> "The bull which Shamash-ellassu has been feeding for offer as *igisûm* is now at Mari. Shamash-ellassu told me,
> 'This bull is growing handsomely; (imposing in) shape!'" Accept then this bull and write to Mubal-shaga to give him in the city [Mari] a bull as replacement so that he may bring it as his *igisûm* present."

73. Yasim-sumu, the palace attendent, sends ARM 13 25 to the king:

> The bull which Warad-ilishu has presented my lord,—in fact as he presented it—was turning sick. I stood by my lord to inform him, "It may yet become healthy, let it remain (here) for a couple of days or so, then let his condition be decided."
>
> Now, however, this bull has really gotten ill. If it suits my lord, this bull ought to be handed to merchants, and one bull ought to be supplied as replacement.

The bull in question may well have been an *igisûm* to the palace.

b. Yaqqim-Addu injects here a *justification* (8-?) addressed only to Shunukhra-Khalu: Surely he will recognize that Yaqqim-Addu's *igisûm* can only be of quality; furthermore, he must know that Yaqqim-Addu has been very responsible when animals are placed under his care.

c. Yaqqim-Addu is now ready to make a suggestion which he hopes Shunukhra-Khalu will support. Two *appeals* to Shunukhra-Khalu's friendship and collegiality (16-17; 29) sandwich the *request* (18-28).

d. While this *request* is likewise twofold, here its two components are split, allowing Yaqqim-Addu to introduce the problem under two aspects:

i. the first is *hypothetically stated* (20b-22), very much equivalent to what Yaqqim-Addu told the king in his opening statement.

ii. At its second manifestation, however, the death of the bull is no longer hypothetical, but comes closer to being *a certitude* (26-27), although Yaqqim-Addu fervently hopes it will turn out otherwise. (25)

e. Yaqqim-Addu ends by soliciting a reponse, a phenomenon common enough to this type of literature. However, the insertion of *qa-tam ana qa-tim* betrays his anxiety about the matter.

Reading these last clauses, Shunukhra-Khalu must conclude that the bull is certainly going to die and that if, indeed, he is to show his concern for Yaqqim-Addu's plight, he better convince the king of his governor's good sense. However, if the following letters are any indication of Yaqqim-Addu's veracity, Shunukhra-Khalu may have paused before defending his *ra'īmum* in Saggaratum.

hh. ARM 14 59

Yaqqim-Addu to Shunukhra-Khalu

[4-7] You have written me about Ishkur-shaga and Nanna-ibila-mansi, Sin-Mushallim's son.

[8-9] The son of Sin-mushallim is in Qattunan.

[10-11] Now, I am sending Ishkur-shaga to you.

ii. ARM 14 60

Yaqqim-Addu to Shunukhra-Khalu

[4-10] The following you wrote to me, saying, "I have written you previously about Ishkur-shaga and Sin-mushalim's son. You neither led these men here nor conveyed to me a response to my letter."

[11-21] Why did you send such a letter? Would I ever be negligent about your communication? I have sent Ishkur-shaga previously. About Sin-mushallim's son I wrote to you the following, "Sin-mushallim is living in Qattunan. Your letter should go to Zakira-Khammu so that they could bring to you Sin-mushallim's son." This is what I wrote to you.

[22-25] Now then, I am sending Ishkur-shaga. Previously, I had immediately conveyed a response to your letter.

For our purpose, we need only know that Zakira-Khammu is the governor of Qattunan during Zimri-Lim's early years on the throne. He is replaced by Yatarum, then by Zimri-Addu. Jean[74], cites a letter the latter wrote Shunukhra-Khalu in which he greets him as "brother." That letter

74. Jean, *RÉS* (1938) 130.

may in fact have dealt with the topic raised by Yaqqim-Addu. I leave to footnotes further information about the remaining personalities mentioned in these letters.[75]

Yaqqim-Addu has obviously sent ARM 14 59 a few days earlier than ARM 14 60. This first letter is very matter of fact and is written to respond to Shunukhra-Khalu's request for information about two individuals, a request which has turned into the accusation quoted in ARM 14 60:5-10. In ARM 14 59, Yaqqim-Addu could answer that one of the individuals is in Qattunan and the other is on his way to Shunukhra-Khalu.

The second letter however poses Yaqqim-Addu on the offensive but cannot hide his neglect. Yaqqim-Addu is so insistent about his compliance to Shunukhra-Khalu's request that he opens and closes with variations on this theme. He indeed did send Ishkur-shaga and did give information on Sin-mushallim's son. Yet what follows renders us suspicious. Yaqqim-Addu has actually expanded on his original letter and what he now releases is not quite what he had communicated earlier. In this new (obviously invented) version, Yaqqim-Addu is not aware where Nanna-ibila-mansi can be found, but reports that his father is in Qattunan. He recommends writing to its governor to obtain the man in question. Notwithstanding his earlier claim of having already sent Ishkur-shaga, Yaqqim-Addu ends by asserting that he is on his way.[76]

E. FRAGMENT OF CORRESPONDENCE, INCOMPLETEY CITED.

1. *Letters to Shunukhra-Khalu*

1. Fragment of a letter from Sammetar who complains that Yasim-Dagan neither keeps him posted of strict orders from the king, nor cares about him. Dossin quotes only lines 4-7.

jj. A.4210[77]

About the artisans, since the king has repeatedly imposed upon me the strict orders, I therefore keep on writing to Yasim-Dagan. But he remains deaf, not paying me any attention.

75. Nanna-ibila-mansi is listed among a group of smiths, who among other artisans, tribesmen and functionaries, took an oath at Guru-ilim, probably during Zimri-Lim 18 (=9′), ARM 23 235 i 16. He may have corresponded with a Yakhad-Khammu, but the letter, Bottéro, "Lettres de la salle 110 du palais de Mari," *RA* 52 (1958) 163, is badly preserved.

A number of persons bear this name; but our Sin-mushallim was a Saggaratum functionary who served other Zimri-Lim palaces (cf. ARM 23 23) Since penning my remarks on him in ("Ḫurrians and Hurrian Names in the Mari Texts," UF 6 [1974] 353-54), we have had new information which confirms his location (ARM 22 125—Zimri-Lim 4′; ARM 24 35—Zimri-Lim 12′) and which tell us that he participated in the wine trade (ARM 23 215; cf., perhaps also, the šu.i of ARM 21 398:15 and the supervisor of works in ARM 21 399:34′). For other citations, see also ARM 22, index.

We know of Ishkur-s(h)agas: as a messenger from Andariq (ARM 21 197:1; 380:2) and a jeweler/smith (ARM 21 233:2—Zimri-Lim 4′). It is certainly the latter who is also attested during Yasmakh-Addu's reign in the letter Charpin publishes in M.A.R.I. 5 (1986) 600-01. Most relevant, however, is ARM 2 136:14-26 which contains a message Ishkur-saga sent the king and which makes it clear that he is taking Sin-mushallim's side in a dispute:

> Another matter; When my lord went to Tuttul, he told me the following, "Sin-mushallim's *lagu*-donkey [see ARM 23 346] should accompany Ipqatum, the cook."
>
> However, now that Ipqatum returned from Tuttul, Sin-mushallim has requested his donkey, telling him, "My lord has given me the donkey as a gift." My lord should therefore talk to Ipqatum for them to return Sin-mushallim's donkey."

76. Birot renders ARM 14 60:22-23, "A présent donc, je t'ai bien envoyé, Iškur-šaga," thus referring the event to past times. This may well be so; however, I would have expected a repeat of the adverb of l. 14, *ina pānītim* (PN *aṭṭardam*) (note also its use in l. 24). Instead, what we have is, *inanna anumma* (PN *aṭṭardam*), on which see also M.A.R.I. 5 (1986) 600:18-20.

77. Dossin, "Harâšu(m) *'être muet,'*" *RA* 62 (1968) 75.

2. Charpin[78] cites a letter, to appear in AEM 1, in which Shunukhra-Khalu tells of Elamite triumph in Shubartu [Zimri-Lim 9′].

3. Birot[79] cites S. 115, 72-34, in which someone writes Shunukhra-Khalu to appeal to the king to let his land have water.

4. Jean[80] refers to a letter sent by Zakira-Khammu, one of Zimri-Lim's earliest appointments as governor of Qattunan.

CONCLUSION

The epistolary dossier I have gathered above regarding Shunukhra-Khalu is by no means complete: Beside the letters known to me only from notices, Durand will be publishing letters which Shunukhra-Khalu himself dictated. One of these, cited recently by Durand, bolsters what we infer from A.739: Occasionally the king does send Shunukhra-Khalu on a diplomatic mission.[81] What we do have, however, already confirms the high position Shunukhra-Khalu held in the court of Zimri-Lim. Mari vassals want to exchange various goods; The king's kin and daughters turn to him when needing royal attention; palace officials and subordinates apply to him either to facilitate their tasks or to voice reasons for their failure in previous charges. They try to impress him with their attention to duty, but they also want him to recall the services and favors they do for him. Colleagues are no less solicitous than servants. They want Shunukhra-Khalu to understand their plight and to interfere with the king in case their position is misunderstood. They expect him to have full access to the king and to the correspondence that reaches royal hands as well. All of these correspondents display an eagerness to gain Shunukhra-Khalu's support, and they have flattering words. But because Shunukhra-Khalu heads an imposing household, some of them are willing to supply him with attractive goods as well as personnel.

Yet we need to end this paper on a cautious note. When we compare the information extracted from the letters with those available through administrative archives, the result is sobering. Aside from document (g), and to an as yet unmeasurable extent from document (i), there is little to prepare us for Shunukhra-Khalu's high position at court. The ubiquitous gìr, with which his activities are labelled, is attached to the names of so many palace officials, that were it not for the epistolary evidence, we might have relegated Shunukhra-Khalu to undistictiveness within Mari officialdom. This, of course, would be such a grievous error against our protagonist and such a misjudgment of his worth that we must ask ourselves if the lack of similar testimony has not already compromised our awareness and appreciation of the lives and careers of other Mari dignitaries.

78. Charpin, "Les Elamites à Šubat-Enlil," in De Meyer, Gasche, and Vallat, eds., *Fragmenta Historiae Elamicae*: Mélanges offert à M. J. Stève (Paris, 1986), pp. 132 n. 25.

79. Birot, *Syria* 50 (1973) 2

80. Jean, *RÉS* (1938) 130 (no. 118)

81. Durand cites a letter the king receives from Shunukhra-khalu, wherein the former reports on an interview he has had with an apparently inebriated Hammurabi, king of Yamkhad, p. 43 in "L'organisation de l'espace dans le palais de Mari: le témoignage des textes," in E. Lévy, ed., *Le Système palatial en Orient, en Grèce et à Rome*, Université des Sciences Humaines de Strasbourg; travaux du Centre de recherche sur le Proche-Orient, 9 (Leiden, 1987).

Hipparchus and Babylonian Astronomy

G. J. TOOMER

It has always been known that Hipparchus derived material from Babylonian astronomy. A considerable number of Babylonian observations are quoted in Ptolemy's *Almagest*[1] (which is the principal source of our knowledge of Hipparchus' work), and some of these are explicitly said to have been used by Hipparchus.[2] But it is only in the present century, with the decipherment and interpretation of the relevant cuneiform texts, that his debt to Mesopotamian sources was more fully revealed. This can be documented in so many aspects of his known work that we can be sure that if his *oeuvre* had been preserved entire, rather than coming to us in secondhand accounts, a survey of Babylonian influences on a man who was one of the two most significant figures in the history of Greek astronomy would be much more extensive and detailed than this one can be. Nevertheless, even the evidence presently available is, I believe, sufficient to show that these influences are more pervasive and profound than is commonly supposed.

Knowledge of Babylonian astronomy among the Greeks did not begin with Hipparchus. Leaving aside the more dubious instances sometimes attributed to some of the "pre-Socratic" philosophers, already in the fifth century B.C. the 19-year luni-solar cycle employed by the Athenion Meton[3] was almost certainly modeled on one in use in contemporary Mesopotamia. The detailed description of the constellations by Eudoxus in the first half of the fourth century,

1. References to the *Almagest* are to pages of the Greek text of Heiberg, (ed.), *Claudii Ptolemaei Opera quae exstant omnia*, Vol. I. *Syntaxis Mathematica* (2 vols., Leipzig, 1898, 1903), and the English translation of G. J. Toomer (trans. and Annotation), *Ptolemy's ALMAGEST* (London and New York, 1984).

2. Babylonian lunar eclipses used by Hipparchus: -719 Mar. 8/9 (Heiberg, *Ptolemaei* 1, p. 526, Toomer, *Almagest*, p. 309); -501 Nov. 19 (Heiberg, *Ptolemaei* 1, p. 332, Toomer, *Almagest*, p. 208); and the eclipse triple -382 Dec. 22/23, -381 June 18/19 and -381 Dec. 12/13 (Heiberg, *Ptolemaei* 1, pp. 340-43, Toomer, *Almagest*, p. 211-13). No Babylonian planetary observation is specifically associated with him, but, as will be argued below, it is virtually certain that all the older planetary observations used by Ptolemy, and specifically the Babylonian observations of Mercury in *Almagest* IX 7 (Heiberg, *Ptolemaei* 2, pp. 257-28, Toomer, *Almagest*, p. 452) are derived from a compilation of Hipparchus (compare the reference to him for the immediately preceding old Greek observation).

3. Meton's first cycle began with the year of his observation of the summer solstice, 432 B.C. For further details see my article on him, G.J. Toomer, "METON," *Dictionary of Scientific Biography* 9, pp. 337-340.

and especially the use of the twelve signs of the zodiac,[4] depended in part on Mesopotamian traditions. In the early third century Aristarchus of Samos, according to a plausible interpretation of the transmitted numbers, derived a year length from the Babylonian eclipse period which is usually called "Saros" in modern works.[5] But while these instances are interesting, they are isolated, and are restricted to the use of simple period relations (Meton and Aristarchus) or of classification and perhaps iconography and nomenclature (Eudoxus). It is only with Hipparchus that we see a more complex and systematic exploitation of the resources of the Babylonian astronomers, including not only a whole array of period relations, but also extensive observations and, most notably, mathematical methods.

The turning-point in our understanding of the significance of Babylonian astronomy to Hipparchus' theories was the publication in 1900 of Kugler's *Die Babylonische Mondrechnung*.[6] By analysis of the tablet 272,[7] Kugler showed that *all* the fundamental parameters of Hipparchus' lunar theory, namely that

251 synodic months = 269 anomalistic months
5458 synodic months = 5923 returns in latitude
1 mean synodic month = 29; 31, 50, 8, 20 days

could be derived from various columns of this ephemeris computed for the years 185 to 188 of the Seleucid Era in Babylon. Thus, contrary to what one would assume from reading Ptolemy's account in *Almagest* IV 2, Hipparchus found his lunar mean motions not by comparison of eclipse observations, but by direct borrowing of period relations and precise numbers which had been established in Babylon.[8]

This truly astonishing revelation ought to have attracted much more attention that it did.[9] In particular, it should have directed scrutiny to whether the other information we have about Hipparchus (chiefly from the *Almagest*) might receive a fresh interpretation in its light. In fact it took more than another half-century before this was done, chiefly by O. Neugebauer.[10] What follows here is an attempt to summarize what has been established, expand on it in some particulars, and draw some general conclusions.

4. This is not the place to discuss the difficult question whether Eudoxus' knowledge of such material was immediate or through intermediaries, nor in particular at what time the zodiac was adopted by the Greeks. All that I assert here is that it is well documented in Eudoxus' work.

5. Paul Tannery, "La grande année d'Aristarque de Samos," *Mémoires de la Société des Sciences physiques et naturelles de Bordeaux* (3ᵉ série) 4 (1888) 79-96, reprinted in his *Mémoires Scientifiques* 2 (Toulouse and Paris, 1912), pp. 345-66.

6. Franz Xavier Kugler, *Die Babylonische Mondrechnung. Zwei Systeme der Chaldäer über den Lauf des Mondes und der Sonne*, (Freiburg im Breisgau, 1900).

7. Kugler, *Mondrechnung*, pp. 6-53. Republished with more joins as *Astronomical Cuneiform Texts: Babylonian Ephemerides of the Seleucid period for the Motion of the Sun, the Moon, and the Planets*, O. Neugebauer (3 vols.; Princeton, and London, 1955), No. 122.

8. Hipparchus' actual procedure, which amounted to the verification of the Babylonian parameters by careful comparison of observations, has been clarified by Asger Aaboe, "On the Babylonian Origin of Some Hipparchan Parameters," *Centaurus* 4 (1955) 122-25 and G. J. Toomer, "Hipparchus' Empirical Basis for His Lunar Mean Motions," *Centaurus* 24 (1981) 97-109. I will return to this point below.

9. I have remarked elsewhere (Toomer, *Centaurus* 24 [1981] 99) how neglected it has been among classical scholars.

10. Summed up in O. Neugebauer, *A History of Ancient Mathematical Astronomy*, Studies in the History of Mathematics and Physical Sciences 1, (3 vols., Berlin, Heidelberg and New York, 1975), pp. 339-343. Particularly notable among his earlier studies is "Notes on Hipparchus," in *The Aegean and the Near East. Studies Presented to Hetty Goldman*, (Locust Valley, 1956), pp. 292-296.

Observations:

It is abundantly clear that Hipparchus not only used Babylonian astronomical observations, but systematically collected them and arranged them in a form suitable for use by Greek astronomers. Ptolemy must have had available a more or less complete record of lunar eclipses going back several hundred years, in order to be able to select eclipses precisely fulfilling narrowly defined criteria, as he does for instance in *Almagest* IV 9. That this record was one compiled by Hipparchus is strongly suggested by the fact that the only eclipse observations cited by Ptolemy for the nearly 300 years following Hipparchus are his own. Neugebauer[11] has interpreted Pliny's statement (*NH* II 53) that Hipparchus predicted solar and lunar eclipses for a period of 600 years as a misunderstanding of a compilation by Hipparchus of eclipse records for the 600 years preceding his time, that is, stretching back to the reign of Nabonassar, which, as we shall see below, marked an epoch in the keeping of astronomical records in Babylon. I regard this interpretation as virtually certain.

Hipparchus did something similar for planetary observations, as is explicitly testified at *Almagest* IX 2: "All that he [Hipparchus] did was to make a compilation of the planetary observations arranged in a more useful way."[12] Again, I have no doubt that all the planetary observations cited by Ptolemy in the *Almagest*, none of which, apart from his own, are later than the third century B.C., stem from this compilation of Hipparchus. These include some earlier Greek observations, but also Babylonian, and, as was mentioned above,[13] it is likely that the latter as well as the former were discussed by him.

Period Relations:

Besides the period relations linking the moon's return in anomaly and latitude with the synodic month, which, as already related, furnished the whole basis for Hipparchus' lunar theory, Ptolemy tells us (*Almagest* IX 3) that Hipparchus determined the following period relations for the planets:

For Saturn, 57 returns in anomaly correspond to 59 years and 2 returns in longitude;
for Jupiter, 65 in anomaly to 71 years and 6 in longitude;
for Mars, 37 in anomaly to 79 years and 42 in longitude;
for Venus, 5 in anomaly to 8 years and 8 in longitude;
for Mercury, 145 in anomaly to 46 years and 46 in longitude.

Exactly the same relationships are contained in that type of Babylonian documents which have been named "Goal-Year Texts,"[14] and Hipparchus must have derived them from that or some other Mesopotamian source.

It is interesting that the periods underlying the more sophisticated Babylonian ephemerides,[15] which are much longer, are not explicitly attested as used by Hipparchus, but are found in much later Greek astrological writers.[16] It is a plausible conjecture that Hipparchus was the channel for these too (I shall return later to the relationship between Hipparchus' innovations and Greek astrology).

11. Neugebauer, *HAMA* 1, pp. 319-321.

12. Heiberg, *Ptolemaei* 2, p. 210, Toomer, *Almagest*, p. 421.

13. See n. 2.

14. *Late Babylonian Astronomical and Related Texts* (copied by T.G. Pinches and J.N. Strassmaier; prepared for publication by A.J. Sachs; Providence, 1955), nos. 1213-1367. Cf. Neugebauer, *HAMA* 1, p. 554.

15. *ACT*, Nos. 300a to 709.

16. For details see Neugebauer, *HAMA* 2, p. 605.

It seems likely that in the obscure but important period of Greek astronomy between Hipparchus and Ptolemy the normal way of expressing planetary mean motions was by means of a period relation in integer revolutions, and that this practice stems from Hipparchus. Quite soon after Hipparchus (if indeed it is not due to him) was conceived the idea of expressing all the planetary motions as integer revolutions over some huge common period, which is characteristic of the Indian astronomical *siddhāntas*; I (in agreement with van der Waerden) believe that the latter derived from the Greek "Aeon-tables."[17] The only extant Greek text embodying this approach is the enigmatic "Keskinto Inscription,"[18] dedicated at Rhodes (where Hipparchus worked), probably not long after his lifetime.

Mathematical Methods:

Babylonian mathematical astronomy is characterized by arithmetical methods, especially by the use of functions with constant numerical differences, in sharp contrast to the geometrical methods of classical Greek astronomy. Hipparchus certainly used the latter, but there is considerable evidence that on occasion he had recourse to the former as well. A crucial topic is the varying length of day and night, which is a function of the sun's position in the ecliptic and of the terrestrial latitude. An exact mathematical solution of this problem requires[19] the use of spherical trigonometry (as demonstrated by Ptolemy in *Almagest* II 2-5). All the evidence suggests that spherical trigonometry was not available until the fundamental theorems were established by Menelaus (ca. A.D. 100). Yet the problem was solved, approximatively, in Greek astronomy before that time. The method used is very suggestive. In Babylonian astronomy the variation in the length of daylight at Babylon is expressed by an arithmetical progression, on the assumption that the ratio of longest to shortest day is 3:2. Exactly the same method is expounded by Hypsicles in his "Anaphorikos," but transplanted to the latitude of Alexandria, for which he assumes a ration of 7:5. Hypsicles cannot be dated more precisely than as a contemporary of Hipparchus.[20] It is impossible to say whether he owed his knowledge of this procedure directly to Hipparchus, although in view of the evidence for Hipparchus' communication with the Alexandrian astronomers of his time, I consider that a plausible conjecture. In any case, the use of arithmetical methods in Greek astronomy is found nowhere before Hipparchus, and abundantly (given the meager nature of our sources) afterwards.[21] Most notable, for our purposes, are the numbers excerpted by Strabo from Hipparchus' geographical treatise, which, as Neugebauer has shown,[22] imply his use of arithmetical methods for finding the noon solar altitude.

It is only recently that another Babylonian procedure has been definitely linked to Hipparchus. This is the use of the 248-day period for the short-term prediction of the lunar position. Since 248 days are very nearly equal to 9 anomalistic months, it is possible to describe the moon's varying daily motion by establishing a "template" with 249 entries, the last of which is identical to the first, that is, using the assumption that the moon returns to the same velocity after precisely 248 days. Such a template is found in the Babylonian text *ACT* 190 (which employs a linear zig-zag

17. See Toomer, *Almagest*, p. 422, with n. 12.
18. See Neugebauer, *HAMA* 2, pp. 698-705.
19. I cannot discuss here the possible earlier use of "analemma" methods to solve such problems. On Hipparchus' probable use of an analemma to solve a simpler problem in spherical astronomy see Neugebauer, *HAMA* 1, pp. 301-303.
20. See George Huxley, "Studies in Greek Astronomers," *Greek, Roman and Byzantine Studies* 4 (1963) 83-105.
21. For other examples see Neugebauer, *HAMA* 2, p. 717ff.
22. Neugebauer, *HAMA* 1, pp. 304-306.

function of a well-known type), and it is used to calculate the true lunar position over a short period in the group of texts *ACT* 191-96. Neugebauer showed that the 248-day period is the basis of the method of calculating the true position of the moon over much longer periods known mainly from Greek papyri and from Indian texts which are surely derived from Greek forerunners.[23] That Hipparchus was an essential link between the Babylonian and Greek versions is shown by a direct quotation in a report of an observation by him in *Almagest* V 3, literally "the course [of the moon] was 241,"[24] a number which made no sense (and hence was usually "emended") until I noticed that the date exactly fitted a day-number of 241 in the 248-day period.[25] It has long been apparent that the procedure for calculating the lunar position based on this period was the norm in Greek astronomy until it was superseded by the more rigorous methods of the *Almagest*. It now looks as if this approach originated with Hipparchus, again borrowing from Babylonian astronomy. Whether he used a linear zig-zag function to describe the variation in the moon's velocity over the 248 days cannot be determined. It is certain, at least, that the parameters of the Babylonian function were known to the Greeks, since Geminus (first century A.D.) gives the extreme values and difference-value of the function, as well as the length of the anomalistic month implied by it.[26] Again, Hipparchus is the most plausible channel for this knowledge.

Terminology and Metrology:

It is well-known that the standard Greek terminology for eclipse magnitude, the digit (δάκτυλος), where a magnitude of 12 digits represent totality, is borrowed from Babylonian practice. Less well-known is the use of the term "cubit" (πῆχυς) for astronomical measurement, where one cubit corresponds to 2° or 2½°. But use of this Babylonian unit is attested for Hipparchus both in the *Almagest*[27] and by Strabo,[28] and is found frequently in his extant *Commentary on Aratus*. From the *Almagest* it is apparent that it was obsolete in Ptolemy's time.

One of the most useful contributions of the Babylonians to Greek astronomy is the sexagesimal place-value system. It would have been hard for Ptolemy to carry out the many laborious arithmetical computations of the *Almagest* without the use of sexagesimal fractions. It seems probable that the first appearance of these in Greek astronomy was in connection with the subdivision of the circle into 360 degrees and the further subdivision of these into 60 minutes and so on. It is impossible to determine exactly when this system of circular measurement was borrowed from Babylonian astronomy, but, again, there are no certain examples before the time of Hipparchus (it is found both in his *Commentary on Aratus* and in Hypsicles' *Anaphorikos*).

Thus, although our information about Hipparchus' works is largely secondhand and fragmentary, his extensive knowledge of both the observational and theoretical parts of Babylonian astronomy is beyond any doubt. The question arises, how did he acquire that knowledge?

23. The seminal paper is O. Neugebauer, "Tamil Astronomy: A Study in the History of Astronomy in India," *Centaurus* 10 (1952) 252-76.
24. Heiberg, *Ptolemaei* 1, p. 363, Toomer, *Almagest*, p. 224.
25. Remarked Toomer, *Centaurus* 24 (1981) 108 n. 12. The whole topic of the 248-day period has now been discussed brilliantly by Alexander Jones, "The Development and Transmission of 248-day Schemes for Lunar Motion in Ancient Astronomy," *Archive for History of Exact Sciences* 29 (1983) 1-36, who conjectures, plausibly, that the man responsible for the extended method exemplified in the Greek and Indian texts was Apollinarius (? first century B.C.).
26. Geminus, *Eisagoge* 18. Cf. Neugebauer, *HAMA* 2, pp. 585-587. Geminus also quotes, for the length of the mean synodic month, the value 29;31,50,8,20 days, which, as we have seen, was derived by Hipparchus from Babylonian sources.
27. VII 1, Heiberg, *Ptolemaei* 2, p. 6, Toomer, *Almagest*, p. 323 (see also p. 322 n. 5).
28. *Geography* 2, 1, 18.

Before attempting an answer to the question, I must summarize the nature of the Babylonian astronomical texts, as exhibited in the surviving documents. A classic paper on this subject was published a generation ago by A.J. Sachs;[29] despite the great increase in the number of known texts since then, his classification has withstood the test of time in all essentials. Briefly, it is as follows:

1. *Astronomical Tables*. These are the calculated ephemerides of the moon and planets, since published by Neugebauer in *ACT*.

2. *Almanacs*. Each Almanac covers one Babylonian year, and reports, for each month, certain astronomical phenomena: for the moon (in particular, whether the month had 29 or 30 days); for the planets (date and zodiacal sign of certain planetary phases, and the dates of entries into a new zodiacal sign); dates of solstices and equinoxes; phases of Sirius; predicted dates of solar and lunar eclipses.

3. *Normal-Star Almanacs*. These are similar in structure to the Almanacs, but for the planets, instead of recording the entries into the zodiacal signs, give the dates and situations in which the planets pass by the "Normal Stars" (a class of 30 fixed stars near the ecliptic).

4. *Goal-Year Texts*. Contain information about planetary phenomena for the planets (including dates and zodiacal signs of phases) and the moon (including eclipses) *n* years before the "goal-year," where *n* is 18 years for the moon and a standard period for each planet (for example, 59 years for Saturn, 71 or 83 years for Jupiter). Sachs characterizes them as "the raw materials for the prediction of planetary and lunar phenomena for a given year."

5. *Diaries*. Each Diary covers half of a Babylonian year (6 or 7 months), and records, often day-to-day, a great variety of astronomical and meteorological phenomena, including the position of the moon and the planets with respect to Normal Stars, whether a month was 29 or 30 days long, the dates of phases and entries into zodiacal signs of the planets, and details of lunar and solar eclipses. In addition, at the end of each month are recorded the prices of barley, wool, and other standard commodities; the zodiacal signs in which the planets were in that month; the varying height of the river at Babylon; and noteworthy events, both religious and secular, which occurred at Babylon.

There are astronomical texts which do not fall into any of the above categories, for example, horoscopes and lists of lunar and solar eclipses arranged in 18-year ("Saros") groups.[30] But the great bulk of the extant material is covered by one of the five. While categories (2) to (5) may be loosely classed as "observational" texts, as opposed to the "computed" texts of (1), it should be noted that even within the former some of the information is computed. For instance, as Sachs discovered, the dates of the Sirius phenomena in the Almanacs and Diaries are computed according to a simple scheme.[31] Furthermore, there is a significant difference between the Diaries and all other "observational" texts. While the latter, as far as is known, all come from the Seleucid period,[32] the origin of the Diaries is much earlier. The earliest datable one comes from -651, and there is good reason to suppose that they originally went back as far as the reign of Nabonassar (Nabû-nāṣir, -746 to -732).[33]

29. A. Sachs, "A Classification of the Babylonian Astronomical Tablets of the Seleucid Period," *JCS* 2 (1948) 271-90.

30. *LBAT*, nos. 1458-76 and 1413-30 respectively.

31. A. Sachs, "Sirius Dates in Babylonian Astronomical Texts of the Seleucid Period," *JCS* 6 (1952) 105-114.

32. With the possible exception of the horoscope *LBAT*, no. 1458, dated by Sachs to -409/8.

33. The reasons are Ptolemy's statement (*Almagest* 3, p. 7, Heiberg, *Ptolemaei* 1, p. 254, Toomer, *Almagest*, p. 166) that "the ancient observations" were preserved from that time, and the fact that the "Babylonian Chronicle" begins with that king's reign.

Sachs several times expressed to me his opinion that the Diaries were the source of all the other Babylonian observational material, and the more I reflect on both the observational and theoretical sides of Babylonian astronomy, the more convinced I am that he was right. They are, ultimately, the source of the eclipse and planetary compilations assembled by Hipparchus. But they must also have provided another kind of information essential for anyone who wished to use them to establish an observational basis for theoretic constructs, be he Babylonian[34] or Greek. All these observations were originally dated by the Babylonian calendar, in which the variation between 29- and 30-day months was determined by observation of the new crescent, and a 13th month was intercalated in some years (a regular 19-year intercalation cycle was established only in the fifth century B.C.).[35] The only way to find the precise interval between two observations was to count the number of 29- and 30-day months intervening, and that was information that only the Diaries could provide. When Hipparchus made his "compilation of the planetary observations arranged in a more convenient way" (and the same certainly applies to his eclipse compilation) a primary concern must have been to date them in a calendar which Greek astronomers could use (almost certainly the Egyptian calendar).[36] To do this for the Babylonian observations, therefore, he had to have either direct knowledge of the Diaries or use of the results of someone else who had already digested from them the necessary information on the sequence of months. (As we saw above, this information had already been extracted for the Almanacs). In either case I find it hard to imagine how Hipparchus could have acquired the information without personal contact with an expert in the arcana of cuneiform astronomical records, that is, one of the small class of scribes at Babylon who were concerned with these matters.

Let us dismiss at once the notion that there was ever a formal "publication" in Greek of the cuneiform texts from which Hipparchus made his compilations. Apart from the inherent improbability and uselessness of such a "translation" for anyone who did not have a native expert to guide him, there is no trace in the *Almagest* or elsewhere of Greek use of such material which cannot plausibly be derived from Hipparchus' treatises. The conclusion to which I am driven is that Hipparchus must have visited Babylon, have persuaded one or more of the astronomer scribes there to communicate to him enough of their records and methods for him to grasp the extent of the first and the basic principles of the second, and have spent enough time there to have his informant extract and translate for him a considerable number of observations.

What were the documents from which these extracts were made? It is clear that the Diaries were the ultimate source. But we have already seen that the Babylonian astronomers had made extracts from them which would have been of more direct use. In particular, eclipse lists, arranged by "Saros," survive;[37] presumably such lists were the formal basis of Hipparchus' own

34. Recent years have seen much progress in our understanding of how analysis of the frequency and distribution of astronomical events, based on exactly the kind of information which the Diaries provide, could have led to the particular models and numbers of the *ACT* ephemerides. See for example, Aaboe, *The Place of Astronomy in the Ancient World*, Philosophical Transactions of the Royal Society of London A., 276, (1974), especially pp. 32-36, with the references there cited.

35. For details see Neugebauer, *HAMA* 1, pp. 354-355, and Richard A. Parker and Waldo H. Dubberstein, *Babylonian Chronology 626 B.C.-A.D. 75* (Providence, 1956), especially pp.1-3.

36. All Babylonian eclipse observations quoted in the *Almagest* are given with regnal year and in the Egyptian calendar, with the significant exception of the group of three in IV 11, which are given according to the Athenian archon and month in the artificial "Metonic" calendar, but also with Egyptian date which is specifically quoted from Hipparchus (Heiberg, *Ptolemaei* 1, p. 340, Toomer, *Almagest*, p. 212).

37. See n. 30 above.

canon. In addition, the Babylonian astronomers must surely have compiled, at least for their own use, the record of the complete sequence of 29- and 30-day months reaching back to Nabonassar which was so essential for Hipparchus' calendric conversion. Thus it is not necessary to suppose that Hipparchus had direct access to the Diaries.

There is, furthermore, a difference in the fullness of the records between the eclipse observations and the planetary observations. Whereas it seems certain that Hipparchus compiled virtually complete lists of at least the lunar eclipses observed in Babylon between Nabonassar and his time, the available evidence suggest that none of the planetary observations he brought back predated the third century. Ptolemy quotes none from an earlier period; yet for his determination of the planetary mean motions in *Almagest* IX and X he should, in accordance with his own principle,[38] have used the earliest reliable observations available; moreover he complains in IX 1 that "we have records of planetary observations only from a time which is recent in comparison with such a vast enterprise."[39] To venture a reason for this difference in Hipparchus' treatment of eclipse and planetary observations must be speculative. But it should be noted that no cuneiform extracts of planetary observations comparable to the eclipse lists have been found (however likely it might seem that the Babylonian astronomers should have made such extracts for their own use in working out the theoretical basis of the planetary ephemerides).[40] Furthermore, among the extant Diaries, those from the third and second centuries are much more densely represented than those from an earlier period.[41] It may well be that considerable loss from or damage to the archive had occurred before the time of Hipparchus (but after the eclipse records had been extracted), and that the distribution of the modern finds is not entirely due to the accidents of discovery.

When one considers the role that the wealth of eclipse observations and accurate lunar and planetary periods played in the development of Greek astronomy, as reflected in the work of both its most important practitioners, Hipparchus and Ptolemy, one must admit that the contribution of Babylonian astronomy to Greek (and hence the whole of medieval) astronomy is central. But there is another aspect of Babylonian astronomy which, though less easily defined, is in my opinion at least as important for Hipparchus' thought and the direction of Greek astronomy.

The great original contribution of the Greeks to astronomy was the idea of using geometric models, and in particular uniform circular motion, to explain the apparently irregular motions of the heavenly bodies. Whoever was responsible for this idea, it was first applied in practice in the brilliant though unsuccessful "homocentric" system of Eudoxus, and then again (perhaps early in the third century B.C.) in the epicyclic/eccentric system which found its culmination in the *Almagest*. But everything that we know about these earlier Greek geometric models suggests that they were only explanatory, not predictive; that is, the geometric systems were not quantified beyond the assignment of fairly crude periods to the rotations of the various spheres.[42] Practical

38. III 1, Heiberg, *Ptolemaei* 1, pp. 202-203, Toomer, *Almagest*, p. 137 with n. 18.

39. Heiberg, *Ptolemaei* 2, p. 208, Toomer, *Almagest*, p. 420.

40. There are indeed many planetary observations in the Almanacs and Goal-Year Texts, and these might well have served Hipparchus' needs. But, as already noted, this type of text does not appear to have predated the Seleucid Era.

41. This is readily apparent from the chart in A. Sachs, "Babylonian observational astronomy," in *The Place of Astronomy in the Ancient World*, p. 47.

42. I will not discuss Schiaparelli's (Giovanni Schiaparelli, *Le Sfere Omocentriche di Eudosso, di Callippo e di Aristotele*. Memorie del Reale Instituto Lombardo, Classe di scenze matematiche e naturali, 13 [Milan]. Reprinted in his *Scritti sulla Storia della Astronomia Antica* 2 [Bologna, 1926], pp. 3-112) remarkable feat of arraying the skeleton of Eudoxus' system in a complete numerical panoply to agree as closely as possible with modern results, except to say that even to make the attempt is to misread the ancient evidence.

Greek astronomy of the fourth and third centuries remained at the level of making observations of solstices (and occasionally equinoxes) and the phases (and sometimes declinations) of stars, the principal purpose of which was presumably to produce improved star and weather calendars ("Parapegmata"), which were perennially popular from the time of Meton onwards, and to which all astronomers of note, including Eudoxus, Hipparchus and Ptolemy, contributed. Besides this, we know of a few third-century observations of planetary phases (presumably connected with an interest in planetary periods) and can detect a continuing interest in assigning magnitudes to the sizes and distances of the planets (with notably poor results until Hipparchus devised his brilliant method of finding the lunar distance). Thus, while epicycles and eccentrics were used to represent the planetary motions (and some elegant mathematical theorems developed in consequence), no one, as far as we know, attempted to assign precise sizes to all the parts of a planetary system, let alone predict the position of a given heavenly body at a given time.[43]

It is here that Hipparchus was most innovative. He took the existing Greek geometrical models and adapted them to the prediction of actual heavenly positions. This required two things. The first was derivation of exact sizes for the various epicycles and/or eccentrics. We know in detail from Ptolemy how Hipparchus did this for the sun and moon (and also that he failed to do it for the planets). The second requisite was a method of calculating the position of a body once these sizes were known, in other words, trigonometry. The basis of ancient trigonometry was a table of chords, and, once again, there is no trace of such a thing, or of trigonometrical calculation, before Hipparchus, for whom it is explicitly attested.[44]

I have no doubt whatever that it was Hipparchus who changed Greek astronomy from a largely theoretical to a predictive science. In this his originality and inventiveness are beyond question. But it would not have been possible without the resources of Babylonian astronomy.[45] The further point to make here is that, given Hipparchus' acquaintance with the methods of Babylonian astronomy, we must surely conclude that the idea of astronomy as a practical, predictive science was another debt of his to the Babylonians.[46] At the time when I suppose that he made his visit to Babylon, the astronomers there had developed, and were still practising, the methods of predicting solar, lunar, and planetary positions, by applying mathematical procedures to period relations, which are exemplified in the *ACT* texts. Although there is no trace of any knowledge of the sophisticated arithmetical techniques[47] of the *ACT* in any Greek text, we cannot doubt that Hipparchus' informants at least revealed the existence of such techniques to him. The conclusion seems inescapable: he realized that the same thing could be done using existing Greek geometrical models.

We see in Hipparchus the confluence of the two traditions in astronomy: Greek geometrical models and Babylonian numerical and predictive methods. Both are essential to the form which astronomy took after Hipparchus, reaching its ancient culmination in the *Almagest*, but continuing essentially unchanged for well over a thousand years.

43. The often cited reference to the lunar tables of Apollonius of Perge (ca. 190 B.C.) has been shown by Jones, *Archive for History of Exact Sciences* 29 (1983) 31, to be due to a manuscript corruption of the name of the much later astronomer Apollinarius.

44. See G. J. Toomer, "The Chord Table of Hipparchus and the Early History of Greek Trigonometry," *Centaurus* 18 (1973) 6-28, which also argues against the existence of a pre-Hipparchan trigonometry.

45. I have emphasized elsewhere (Toomer, *Centaurus* 24 [1981] 97-109) that Hipparchus was not content merely to borrow Babylonian period relations, but also, to the best of his ability, confirmed them from observations.

46. This point was well made by Aaboe, *The Place of Astronomy in the Ancient World*, p. 41.

47. I am not talking about the basic notion of a linear zig-zag function, which, as we have seen, is well attested in Greek texts from Hipparchus onward.

A final remark concerns astrology. This is another "science" that has its origins in Mesopotamia, but took the form in which it flourished throughout ancient and medieval times (and still flourishes in India) in the Greek world. The most important element in this is the horoscope, the configuration of the heavens (especially sun, moon, and planets) at the time of birth. Within Greek astronomy, it was hardly possible to calculate this until Hipparchus developed methods of predicting heavenly positions. To venture on the vexed question of the early history of Greek astrology would take me far beyond the limits of my topic. Let me merely state my conviction that astrology had no importance in the Greek world until after Hipparchus, and that his role, both directly as an advocate of astrology, and indirectly as a developer of astronomical methods which became an essential part of it, was pivotal.[48] Here again Babylonian ideas were fundamental to the development of what became a characteristic part of ancient and medieval culture, but the main channel through which they were funneled was Hipparchus.

48. The arguments for this will be presented in my book on Hipparchus.

A Note on Some Prices in Late Babylonian Astronomical Diaries

DONALD J. WISEMAN

In a volume dedicated to the memory and scholarship of Abraham Sachs it seems appropriate to recall some circumstances in which part of his research on Late Babylonian astronomical texts took place and to highlight a hitherto little researched aspect of economic studies which may be derived from it. Abe was already experienced in the history of mathematics and astronomy and their methodologies when he visited the British Museum to collate texts known to him and of which his classification was already widely accepted.[1] My own work there included the provision of a list of unpublished tablets which bore historical data, so Sachs' advice was eagerly sought to help identify the references in astronomical diaries which I had noted. He was an able, friendly and sympathetic companion and teacher and devoted some time to enable me to master the distinctive characteristics of Astronomical Tables, (Normal Star) Almanacs, Goal Year texts and especially the astronomical diaries to which my attention had been drawn.[2] The Keeper, Cyril J. Gadd, wisely agreed that it would be more expeditious if we made a joint exploration of the collections of tablets, for other urgent commitments meant that we could spare about one hour a day for this exercise.[3] By the summer of 1952, with additions in the following years, some 1200 texts and fragments were listed and some joins made. It was obvious, however, that little further progress towards publication of the historical matter could be made until the many fragments had been dated on the basis of the planetary observations they recorded. I readily agreed to postpone my part in what was then envisaged as a joint publication,[4] as the finding of

1. A. J. Sachs, "A Classification of the Babylonian Astronomical Tablets of the Seleucid Period," *JCS* 2 (1948) 271-90.

2. By Sidney Smith, *Babylonian Historical Texts* (London, 1924), pp. 124-59 and references in T. G. Pinches, *The Old Testament in the Light of the Historical Records and Legends of Assyria and Babylonia* (London, New York, 1902), pp. 480-84. Since identified as: p. 480 = BM 41581 (Pinches copy 2777-9), 143 Antiochus (*JAOS* 56 [1936] 247); p. 483 = BM 45699 (Pinches copy 2982-3); BM 45693 (Pinches copy 2987-8), Aspasinē; p. 484 = BM 34050 (Pinches copy 2110-1), Arsakā; BM 34039 (Pinches copy 2466-7).

3. I was then working on the Alalakh tablets (published 1953), for which task only two years was allowed before the division of the tablets by the Turkish authorities. During these same years I had also to spend time at Nimrud as epigraphist and in the preparation of the preliminary reports on the texts found there.

4. Sachs, *LBAT* vii, xii. Following his death I felt free to make a preliminary publication of the Alexander text in my *Nebuchadrezzar and Babylon* (Oxford, 1985), pp. 111-21.

other historical texts diverted my attention[5] as did Sachs' rediscovery of Pinches' copies of astronomical texts. The latter formed the kernel of Sachs' *Late Babylonian Astronomical and Related Texts* (*LBAT*).[6] Sachs has, somewhat unfairly, been criticized for the delay in producing the final edition of this major group of texts, but his speedy publication of a large number of these documents in catalogue and copy which appeared in *LBAT* in 1955 must not be overlooked. Moreover, he readily agreed to issue the Late Babylonian King List within months of its discovery[7] and he included data we had found in the Babylonian collections, together with that from my newly discovered Babylonian Chronicles and other neo-Babylonian economic tablets, in the revised edition of Parker and Dubberstein's *Babylonian Chronology 626 B.C.—A.D. 75*.[8]

By 1958 Sachs was noting the meteorological phenomena recorded in the diaries. The observations made at Babylon included reference to cloud or weather conditions which allowed observation (DIR.MUŠ, DIR.AN.LU, DIR.AN.ZA) or prevented it (DIR.NU.PAP) or obscured sightings (such as mist, haze or moisture [AN.UTAH, A.KÁM] or wind [IM, TU_{15}]). He made comparisons between his findings and observations made in Iraq in more recent years.[9] He was particularly interested in instances where specific classes of data seem to have been abstracted from the astronomical diaries or, more likely, from the mutual source available for such information. A separate tablet listed the readings for a single planet, Mercury, for -389 to -374.[10] We looked in vain for a tablet which might have abstracted the flood-levels of the River Euphrates at Babylon recorded in the diaries including variants of level within a given month. The diaries recorded difference of level (A.DAN) by cubit (KÙŠ) and fingers or degrees (ŠU.[SI], *ubānu*) with indications of recession (LAL[-*is*], *itteḫis*) between 15 cubits (c. 7.5 m) and 3 fingers (c. 50 cm), indicating precise measurements. On one occasion variants are listed five times in a single month (BM 34050). These entries do not appear to be recorded to show how the levels affected agricultural production, though that would have been an obvious result. They relate to the astronomical phenomena as separately discussed in *Enuma Anu Ellil*, but here more directly to the signs of the zodiac in which the five planets were at the time as listed before the river levels.

No "Nilometer"[11] has yet been discovered at Babylon, so it may be suggested that measurements were taken near Etemenanki, either by the wall to its west which was kept in repair to prevent the flooding of its platform or by the steps leading down from the quay there. These steps were at 1.4 m above the normal water level (-3.42) and the steps descend a further five meters from it to reach the river at its low level.[12] This point of measurement is more likely

5. D. J. Wiseman, *Chronicles of Chaldean Kings (626-556 B.C.) in the British Museum* (London, 1956).

6. *LBAT*, Brown University Studies 18 (1955).

7. A. J. Sachs and D. J. Wiseman, "A Babylonian King List of the Hellenistic Period," *Iraq* 16 (1954) 202-12.

8. Brown University Studies 19 (1956).

9. For example, with *Climatological Means in Iraq* (Baghdad Meteorological Department Publication No. 10 [1954]), loaned us by the Air Ministry Meteorological Office Library for study at the British Museum. His previous main reference had been Sir Napier Shaw and E. E. Austin, *Manual of Meteorology* 1 (Cambridge, 1932), especially pp. 22 and 30. H. Hunger published weather omens in ZA 66 (1976) 234-62.

10. A. Sachs, "Babylonian Observational Astronomy" in F. R. Hodson (ed.), *The Place of Astronomy in the Ancient World* (British Academy, 1974), p. 49. Sachs once pointed out to me a tablet abstracting the 19-year cycle of intercalations from the time of Nabû-nāṣir onwards, but I cannot trace this and may have been mistaken. A distinct group of tablets noted in our search for late dated tablets included notes passed by Bulluṭ and Nabû-kuṣuršu, officials in charge of *suadu*-aromatics used in beer brewing. These are now published in copy by D. A. Kennedy (CT 49 18-66). My own notes add to this BM 42528 (81-7-1,287) Nabû-kuṣuršu and BM 42495 (81-7-1,255) Bulluṭ, both Alexander year 8. Other unpublished(?) economic texts dated to "Alexander" include BM 36154, 37623, 40597, 41096, 47536 (Yr. 9), 78243.

11. Compare L. Borchardt, *Nilmesser und Nilstandsmarken* (Berlin, 1906).

12. G. Bergamini, "Levels of Babylon Reconsidered," *Mesopotamia* 12 (1977) 114; D. J. Wiseman, *Nebuchadrezzar and Babylon*, p. 57.

than at the similar steps by the water-reservoir northeast of the citadel.[13] Observation of the river level at the "Median Wall," north of the city near Opis, while serving as a reasonable flood-warning station, would have been impractical without access for immediate calculation and reporting.

Apart from the observation of the planets which take up the major part of the astronomical diary covering each six months allotted to a tablet, the prices of commodities may be given in separate lines. They always follow the strict order of barley (ŠE[-*im*]), dates (ZÚ.[LUM.MA]), mustard (KÀS), cress (SÁḪ.[LE_{10}]),[14] sesame (-oil, GIŠ.Ì)[15] and wool (SÍG.[ḪÁ]). This order may represent a traditional view of the staple commodities used in daily life or those which entered the temple regularly. Since the prices are given in precise measure, with variations within a month or several days given, they were the results of actual observation.

A number of fragmentary texts (pp. 367ff.) show that prices were copied on separate tablets in the same order of commodities as found in the diaries. Entries cover each month over consecutive months, with variant price-levels noted (see, for example, BM 36730 and compare BM 36960). Others list the price of barley and dates alone (BM 36989) or include at least mustard, cress and wool in that order (BM 37034); and with one shekel of silver as the standard (BM 37034). Some tablets were confined to a single commodity.[16] The source and purpose of these lists are not at present retrievable, though the order and precise measurements show a close link with the statements in the diaries themselves.

A sample of the prices (or values) for each commodity taken from dated, or astronomically datable, diary texts is shown in Figure 1.[17] This shows the type of information available from this source for any detailed study of comparative prices. However, only when these texts are fully published and can be compared with all the information taken from other contemporary economic texts should they be used to indicate trends. Certainly the unexpected major variants which occur, for example, for 198/7 or 168/7 B.C. need corroboration before they can be taken as support for inflation. The minute variations in value are against one shekel of silver. The prices bear no indication of being "ideal" or "fixed"[18] or of showing them as an indication of a "good" or "bad" reign. Their place in the diaries between the lunar and planetary phenomena of each month and the signs of the zodiac in which the observed planets stood classes these records as having similar purport as the varied readings of the flood-levels. Doubtless both could have had a practical application.

The relation between these lists of prices and those in the broken Chronicle of Market Prices is not clear.[19] There the order of presentation of the commodities is similar, but the actual values given in the Chronicle seem to be theoretical when compared with prices known from dated economic texts. They may relate to the "tariffs" publicly recorded in collections of law-cases or elsewhere to indicate that the ruler was exercising his divinely given role of maintaining

13. Bergamini, *Mesopotamia* 12 (1977) 136-38. The drain vaults of the North Citadel show wearing on the arches that indicates a difference of c. 4 m. in the normal and maximum levels of the river.

14. The identification is not certain, but see now M. Stol, "Cress and Its Mustard," *JEOL* 28 (1983/4) 24-32. Compare "cress-seed" (*CAD* K 250) or "cardamon" (*CAD* S 62).

15. F. R. Kraus, *JAOS* 88 (1968) 112, against "linseed" as H. Helbaek has it in M. E. L. Mallowan, *Nimrud and Its Remains* 2 (Aberdeen, 1966), pp. 613, 616.

16. Unpublished Pinches copies BM 34598, 34686, 34712, 35089, 35123.

17. The characteristic sloping hand of the scribe of the Seleucid era is more pronounced than is shown in these copies made in 1952.

18. As some interpret ÉP(-*šu*), but *innēpuš* is used in neo-Babylonian sales documents of the actual price paid.

19. A. K. Grayson, *Assyrian and Babylonian Chronicles*, TCS 5, pp. 178-79 and 286-88. BM 48498 has the form and appearance of a scribal extract or even exercise. Line 13 might be read MU 13 ŠE.BAR 1(PI) 3 (BÁN).

EXAMPLES OF COMMODITY PRICES GIVEN IN ASTRONOMICAL DIARIES

Year B.C.	S. Era	BM No.	Barley ŠE			Dates ZÚ.[LUM.MA]			Sesame GIŠ.Ì			Wool SIG.[ḪÁ]	Ref. *LBAT*
			gur	*pi*	*bán*	*sila*	*gur*	*pi*	*bán*	*pi*	*sila*	*ma(na)*	
346/5		46229:12, 20			3	2	3		3	5	3		
332/1		36388 r.4′			3	5			4	5			189
330/29		36761:12′										5	193
322/1		32430 r.3′											n.4 (196)
294/3	28	33805:6										4	211
279/8	33	35400:8′											230
242/1	70	Rm.712:7			3	3							235
222/1	90	41860:3′			3	3							276
211/0	101	45610 r.7′											291
203/2	109	35703 r.7′										4	297
198/7	114	45701:15, 22′					4	1					307
		45616 r.19′					4	4					313
191/0	121	45617:11′, 19′					2	1	1				315
187/6	125	45636 r.10′											326
184/3	128	35054 r.5′					2	1	4				332
183/2	129	45613 r.3′, r.7′											339
181/0	131	34702 r.6′-7′					2						340
180/79	132	34773 r.3′					2	4	2				347
171/0	141	45654 r.9′											348
		45676:9-10′					4	2	-				365
169/8	143	35605:10′		1			2	-					369
		35525 r.2′											372
144/3	168	34045:15					[?]	2	3				373
141/0	171	34050:25, r.30′						3	2	3			406
		45703:16′											418
134/3	178	34039:17						2	3	-			420
133/2	179	34086:6′, 11		1			1	3	4	3			436
130/1	182	34040:											441
112/1	200	34096:29											445
88/7	224	34108											462
78/7	234	45685:24											501
52/1	260/1	Rm.726:10′											516
													521

Year B.C.	S. Era	BM No.	Mustard KÁS (*kasû*)			Cress KID.DA (*sâḫ-le*$_{10}$)			Sesame GIŠ.Ì			Wool SIG.[ḪÁ]	Ref. *LBAT*
			gur	*pi*	*bán*	*pi*	*bán*	*sila*	*bán*	*pi*	*sila*	*ma(na)*	
346/5		46229:12, 20				1	4		[		]	5	189
332/1		36388 r.4′			3	4			[	1]	1	6	193
330/29		36761:12′			6	1	4		[			5	n.4 (196)
322/1		32430 r.3′											211
294/3	28	33805:6											230
279/8	33	35400:8′											235
242/1	70	Rm.712:7				2	3		4	-	-	4	276
222/1	90	41860:3′				2	1		5	[-	]	4	291
211/0	101	45610 r.7′				2	4		5	-	3	4	297
203/2	109	35703 r.7′											307
198/7	114	45701:15, 22′	2	2	3	2	4						313
		45616 r.19′	2	2	3								315
191/0	121	45617:11′, 19′	2	7′	2	3	1	2					326
187/6	125	45636 r.10′	2	2	[?]				3	4	1	4	332
184/3	128	35054 r.5′											339
183/2	129	45613 r.3′, r.7′											340
181/0	131	34702 r.6′-7′											347
180/79	132	34773 r.3′											348
171/0	141	45654 r.9′							3	3	[?]	4	365
		45676:9-10′							1	1	-	4 1	369
169/8	143	35605:10′	3	[?	?]	2	2		1	1	[?]	6	372
		35525 r.2′	4	[?	?]	1	3		1	2	-		373
144/3	168	34045:15				1			1	3	3		406
141/0	171	34050:25, r.30′	2	4	2	1	-	2	4	4	3	2½	418
		45703:16′				1	2	4	4	-	1	2½	420
134/3	178	34039:17							3	-	4	1¾	436
133/2	179	34086:6′, 11				[-]	1	2	3	3	-		441
130/1	182	34040:							3	-	-		445
112/1	200	34096:29											462
88/7	224	34108	3	1	1								501
78/7	234	45685:24	2										516
52/1	260/1	Rm.726:10′										2¼	521

mēšarum-justice.[20] When a detailed work appears on comparative prices in Late Mesopotamia, comparable with those now available for its earlier periods,[21] that would indeed be a lasting tribute to Sachs, for it would cover a subject in which, as in others, he has done pioneering work.

20. *JCS* 7 (1962) 163.

21. For example, W. W. Hallo and J. B. Curtis, "Money and Merchants in Ur III," *HUCA* 30 (1959) 103-39; D. C. Snell, *Ledgers and Prices: Early Mesopotamian Merchant Accounts*, Yale Near Eastern Researches 8 (1982); B. Meissner, *Warenpreise in Babylonien*, Abhandlungen der Preuss. Akad. der Wissenschaften, Phil.-Hist. Kl. 20 (1936) and his "Nachträge" in *Sitzungsberichte der Preuss. Akad. der Wissenschaften*, Phil.-Hist. Kl. 2 (1937) 5-7; W. Dubberstein, "Comparative Prices in Later Babylonia (625-400 B.C.)," *AJSL* 56 (1939) 20-43.

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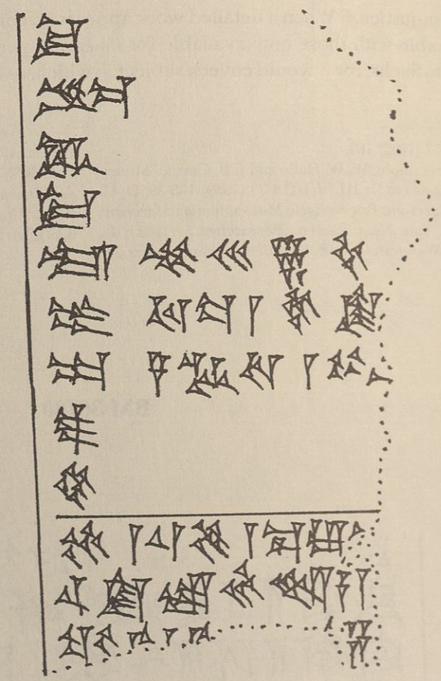

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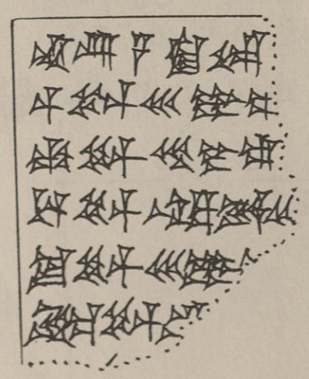

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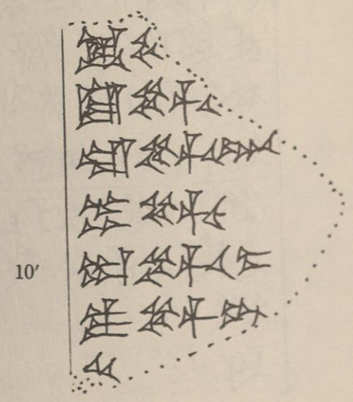

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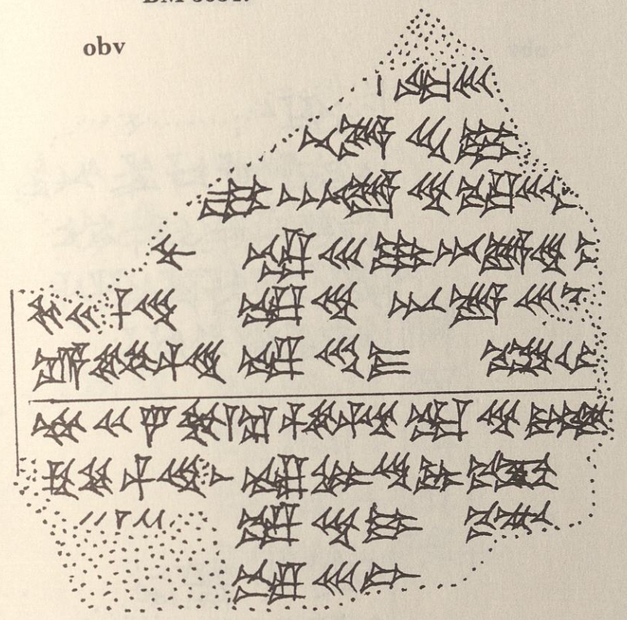

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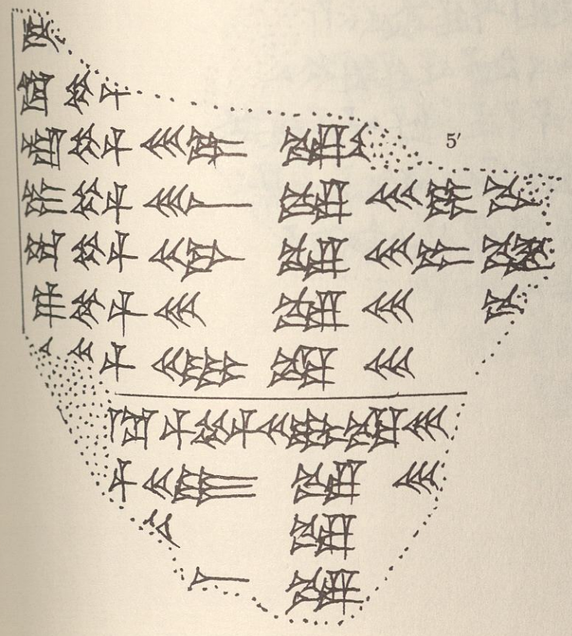

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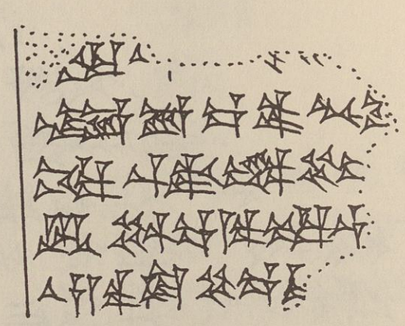

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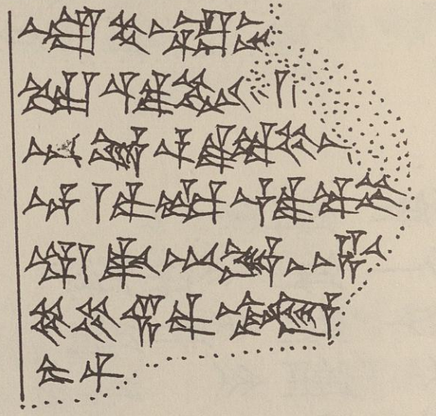

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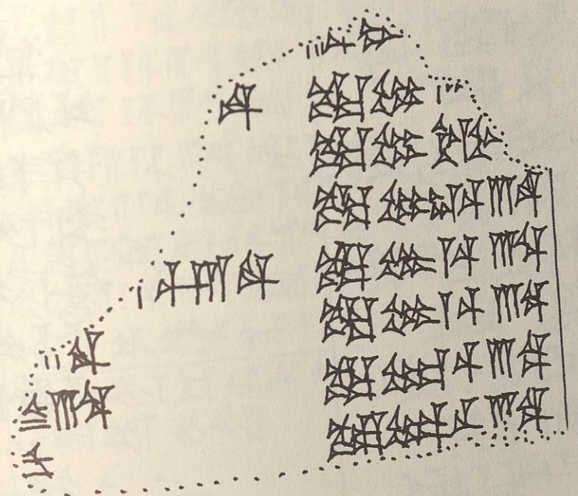

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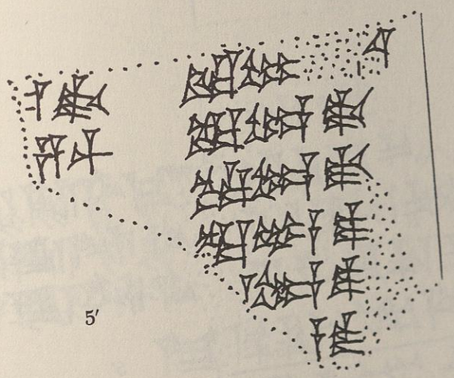

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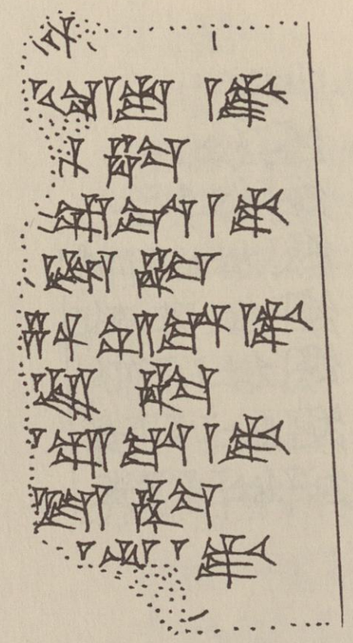

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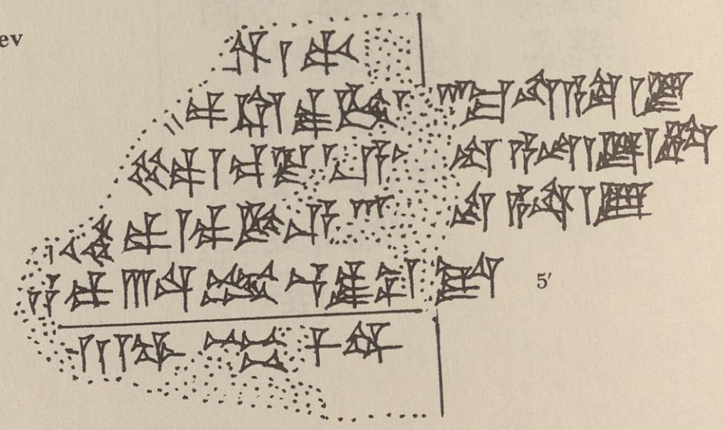

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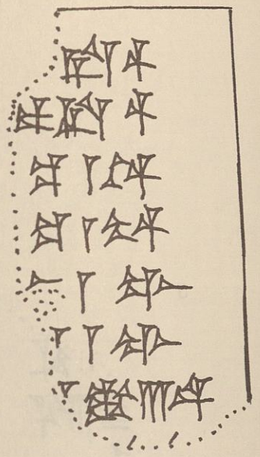

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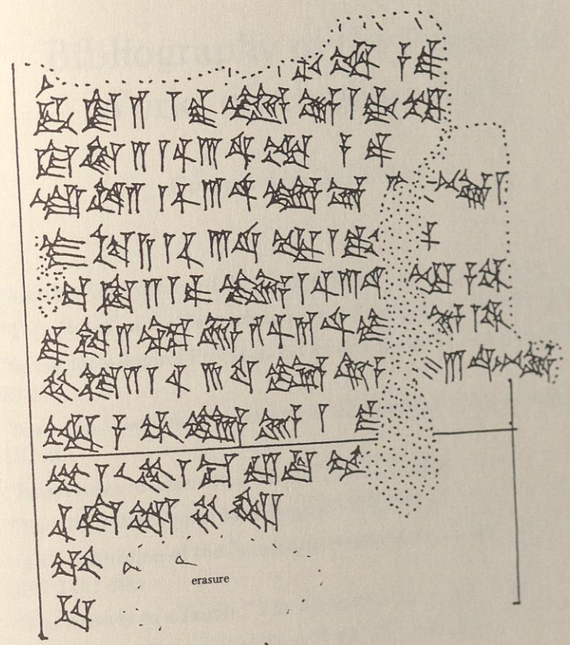

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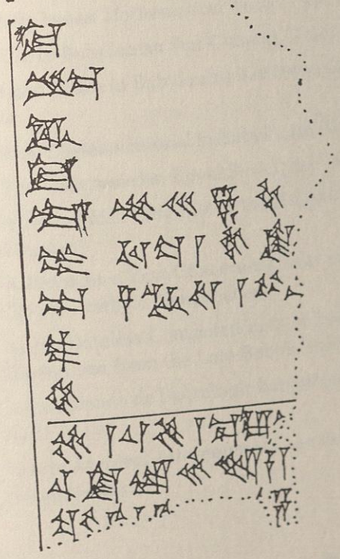

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List of Contributors

Gary Beckman, Yale Babylonian Collection, Sterling Memorial Library, Yale University, New Haven, CT 06520 USA

Hermann Behrens, Babylonian Section, The University Museum, University of Pennsylvania, 33rd and Spruce Streets, Philadelphia, PA 19104 USA

Robert D. Biggs, Oriental Institute, University of Chicago, 1155 E. 58th Street, Chicago, IL 60637 USA

Alan C. Bowen, Institute for Research in Classical Philosophy and Science, 1314 Browning Road, Pittsburgh, PA 15206 USA

Jerrold S. Cooper, Department of Near Eastern Studies, The Johns Hopkins University, Baltimore, MD 21218 USA

L. Timothy Doty, Westminster Presyterian Church, Independence, MO 64052 USA

Maria deJong Ellis, Babylonian Section, The University Museum, University of Pennsylvania, 33rd and Spruce Streets, Philadelphia, PA 19104 USA

Irving L. Finkel, Department of Western Asiatic Antiquities, British Museum, London WC1B 3DG England

Benjamin R. Foster, Yale Babylonian Collection, Sterling Memorial Library, Yale University, New Haven, CT 06520 USA

Bernard R. Goldstein, Department of History and Philosophy of Science, University of Pittsburgh, Pittsburgh, PA 15260 USA

Hans G. Güterbock, Oriental Institute, University of Chicago, 1155 E. 58th Street, Chicago, IL 60637 USA

William Hallo, Yale Babylonian Collection, Sterling Memorial Library,Yale University, New Haven, CT 06520 USA

Harry A Hoffner, Oriental Institute, University of Chicago, 1155 E. 58th Street, Chicago, IL 60637 USA

Jan Hogendijk, Mathematisch Instituut, Rijkuniversiteit Utrecht, Budapestlaan 6, 3508 TA Utrecht, The Netherlands

Hermann Hunger, Institut für Orientalistik, Universitätsstrasse 7/V, A-1010 Wien Austria

Thorkild Jacobsen, Harvard University, Cambridge, MA 02138 USA

E.S. Kennedy, Institute for Advanced Study, Princeton University, Princeton, N.J. 08540 USA

Samuel Noah Kramer, Babylonian Section, The University Museum, University of Pennsylvania, 33rd and Spruce Streets, Philadelphia, PA 19104 USA

W.G. Lambert, Department of History and Archaeology, Birmingham University, Birmingham, B15 2T1, England

Erle Leichty, Oriental Studies, Williams Hall/6305, University of Pennsylvania, Philadelphia, PA 19104 USA

Piotr Michalowski, Department of Near Eastern Studies, 3074 Frieze Building, University of Michigan, Ann Arbor, MI 48109 USA

Sally Moren, Communications, Stanhope Hall, Princeton University, Princeton, N.J. 08540 USA

Karen Rhea Nemet-Nejat, Yale Babylonian Collection, Sterling Memorial Library, Yale University, New Haven, CT 06520 USA

Otto Neugebauer, Institute for Advanced Study, Princeton, N.J. 08540 USA

David I. Owen, Department of Near Eastern Studies, Rockefeller Hall 360, Cornell University, Ithaca, NY 14853 USA

David Pingree, History of Mathematics Department, Box 1900, Brown University, Providence, RI 02912 USA

F. Rochberg-Halton, Department of History, University of Notre Dame, Notre Dame, IN 46556 USA

Jack Sasson, Department of Religious Studies, University of North Carolina, Chapel Hill, NC 27514 USA

G.J. Toomer, History of Mathematics Department, Box 1900, Brown University, Providence RI 02912 USA

Christopher Walker, Department of Western Asiatic Antiquities, British Museum, London WC1B 3DG England

Donald J. Wiseman, Low Barn, Downs Way, Tadsworth, Surrey KT2 5D2 England

TÜRK TARİH KURUMU
KÜTÜPHANESİ